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DPNSS [189]

Interworking Between DPNSS 1 and Other Signalling Systems

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INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

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HISTORY

Issue 1 - July 1984
Issue 2 - May 1985
Issue 3 - March 1988

Issue 4 - December 2001 - Specification renamed as DPNSS[189]
- Unused references removed

1 FOREWORD

This specification details the additional requirements including procedural changes to those given in DPNSS[188] that are necessary for DPNSS 1 to interwork with: PSTN, DASS 2, Decadic Private Circuit and SSMF5. Interworking with ETSI ISDN signalling systems is specified in DPNSS[189-I]. No changes are necessary to the non-DPNSS 1 signalling systems.

NOTE: For a given DPNSS 1 Service or Supplementary Service there is an exact correspondence between the SECTION numbering of this specification and DPNSS[188], except for SECTION 27 which is NOT APPLICABLE and SECTIONS 42-49 which are NOT AVAILABLE.

Interworking with other signalling systems involves both the Gateway PBX, (which converts between DPNSS 1 and the other signalling system), and the DPNSS 1 PBX which is making or receiving the call. In the case of interworking with SSMF5 the action of the Transit PBXs is also affected.

A PBX that supports DPNSS 1 and acts as a Gateway to another signalling system shall, as a minimum, conform to the Gateway requirements for the Simple Telephony Call or the Circuit Switched Data Call as specified in SECTIONS 6 or 7 of this specification for that signalling system.

In addition if the PBX supports a Supplementary Service from SECTION 8 onwards in DPNSS[188] it must conform to the requirements of the corresponding section of this specification for each of the signalling systems supported.

In general the other signalling systems covered in this specification do not provide the Supplementary Services that are available in DPNSS 1. Where a Supplementary Service is not provided by the other signalling system then interworking with DPNSS 1 normally defaults to simple call. This is detailed in SECTION 8 onwards of this specification.

However, SSMF5 and DASS 2 can provide some of the DPNSS 1 Supplementary Services and with these two signalling systems a higher degree of interworking may optionally be provided. The additional requirements for "full" Supplementary Service interworking are included in those sections of this specification where such interworking is possible.

TABLES 1 and 2 are provided as an aid to specify the interworking requirements/capabilities of a PBX. The degree of interworking required/provided by a PBX for each Supplementary Service or signalling system is shown in TABLE 2, as follows:

1 Indicates interworking but not with an equivalent Supplementary Service in the other signalling system.

2 Indicates interworking between the DPNSS 1 Supplementary Service and an equivalent in the other signalling system.

If either the DPNSS 1 Supplementary Service or the other signalling system is not supported then the associated boxes in TABLE 2 should be left blank. Therefore if a Gateway PBX supports a DPNSS 1 Supplementary Service it must support interworking to at least "degree 1" for each signalling system that is shown in TABLE 1 as being supported by that PBX.

If a non-Gateway PBX supports a DPNSS 1 Supplementary Service it must support interworking to at least "degree 1" for each signalling system to which the PBX is required to originate or receive calls, as shown in TABLE 1.

The requirements of SECTIONS 1 to 5 of this specification must be met by any Gateway or non-Gateway PBX that interworks in any way with another signalling system.

2 COMPLIANCE TABLES FOR DPNSS 1 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

TABLE 1

PBX FUNCTION	
GATEWAY WITH THE PSTN	
GATEWAY WITH DASS 2	
GATEWAY WITH DECADIC PRIVATE CIRCUIT	
GATEWAY WITH SSMF5	
NON GATEWAY ABLE TO MAKE AND RECEIVE CALLS TO: PSTN	
DASS 2	
DECADIC	
SSMF5	

TABLE 2

DPNSS 1 SERVICES SUPPORTED		OTHER SIGNALLING SYSTEM			
SECTION	TITLE	PSTN	DASS 2	DECADIC	SSMF5
6	SIMPLE TELEPHONY CALL				
7	CIRCUIT SWITCHED DATA CALL				
8	SWAP				
9	CALL BACK WHEN FREE				
10	EXECUTIVE INTRUSION				
11	DIVERSION				
12	HOLD				
13	THREE PARTY				
14	CALL OFFER				
15	NON-SPECIFIED INFORMATION				
16	SERVICE INDEPENDENT STRINGS				
17	CALL WAITING				
18	BEARER SERVICE SELECTION				
19	ROUTE OPTIMISATION				
20	EXTENSION STATUS				
21	CONTROLLED DIVERSION				
22	REDIRECTION				
23	SERIES CALL				
24	THREE PARTY TAKEOVER				
25	NIGHT SERVICE				
26	CENTRALISED OPERATOR	See NOTE			
27	TRAFFIC CHANNEL MNTCE	Not Applicable			
28	REMOTE ALARM REPORTING				
29	ADD-ON CONFERENCE				

TABLE 2 – (Continued)

DPNSS 1 SERVICES SUPPORTED		OTHER SIGNALLING SYSTEM			
SECTION	TITLE	PSTN	DASS 2	DECADIC	SSMF5
30	TIME SYNCHRONISATION				
31	CALL BACK WHEN NEXT USED				
32	DO NOT DISTURB				
33	REMOTE REGISTRATION OF DIVERSION				
34	REMOTE REGISTRATION OF DO NOT DISTURB				
35	PRIORITY BREAKDOWN				
36	CALL BACK MESSAGING				
37	LOOP AVOIDANCE				
38	FORCED RELEASE				
39	TEXT MESSAGE				
40	CHARGE REPORTING				
41	NETWORK ADDRESS EXTENSION				
42	CALL PARK	Not Available			
43	CALL DISTRIBUTION	Not Available			
44	ROUTE CAPACITY CONTROL	Not Available			
45	WAIT ON BUSY	Not Available			
46	CALL PICK-UP	Not Available			
47	TRAVELLING CLASS OF SERVICE	Not Available			
48	NUMBER PRESENTATION RESTRICTION	Not Available			
49	NON SPECIFIED INFORMATION MESSAGE	Not Available			

NOTE: In the case of the Centralised Operator Supplementary Service the Compliance for each of the constituent Supplementary Services should be consulted/entered.

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SECTION 16	SERVICE INDEPENDENT STRINGS	Issue 2
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SECTION 40	SUPPLEMENTARY SERVICE:	CHARGE REPORTING	Issue 2
SECTION 41	SUPPLEMENTARY SERVICE:	NETWORK ADDRESS EXTENSION	Issue 2

4 HISTORY OF DPNSS[189]

NOTE: From Issue 1 to Issue 3 this specification was known as BTNR 189.

Issue 1 - July 1984
- Interworking with the PSTN and 10pps was previously shown in BTNR 188 Issue 1

Issue 2 - May 1985
- SECTIONS 1-6 made Issue 2
- SECTIONS 7-26 Issued

Issue 3 - March 1988
- SECTIONS 1-6 made Issue 3
- SECTIONS 7-26 made Issue 2
- SECTIONS 27-41 Issued
- SECTION 16 Issued

Issue 4 - December 2001
- Specification renamed as DPNSS[189]
- CLC-DASS2 renamed CLC-ISDN throughout
- Specific changes made to the following sections:
  - SECTION 1
  - SECTION 2
  - SECTION 3
  - SECTION 4
  - SECTION 5
  - SECTION 6
  - SECTION 7

5 REFERENCES

DPNSS[188] Global Issue 7
DPNSS[189-I] Global Issue 2
BTNR 190 Issue 2

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 2 - GENERAL

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HISTORY

Issue 1 - July 1984
Issue 2 - May 1985
Issue 3 - March 1988

Issue 4 - December 2001 - Specification renamed as DPNSS[189]
- Glossary referred to DPNSS[188]

REFERENCES

DPNSS[188] Global Issue 7
DPNSS[189-I] Global Issue 2

1 GENERAL

1.1 When DPNSS 1 interworks with other signalling systems there are two aspects to consider:

i. The signal mapping and conversion required at Gateway PBXs

and ii. The effect interworking with other signalling systems has on the procedures performed by non-Gateway PBXs within the network.

In general the above aspects are detailed in each Service section. However when Calling Line Categories (CLCs) are received at non-Gateway PBXs the following applies:

- Receipt of a message containing CLC-PSTN or CLC-ISDN shall be used by the PBX to determine whether any special action is required on the call eg bar the call, connect caller to an operator etc. If no special action is required the PBX will process the message as if it contained CLC-ORD.

- Action on receipt of CLC-PSTN or CLC-ISDN is a matter for agreement between the purchaser and the supplier but care should be taken that a connection which does not comply with current regulations of the country concerned is not allowed.

NOTE: Reading the contents of a NAM at Transit PBXs is not a mandatory feature of DPNSS 1 but may be used as a method of restricting access on the basis of CLC.

1.2 Any tones and announcements that are applied by a private network to a public network must comply with the current regulations of the country concerned. This will be of particular importance if incoming public network calls encounter either:

- a DPNSS 1 Supplementary Service, eg Diversion;

or - a Gateway PBX which automatically invokes a DPNSS 1 Supplementary Service, eg Call Offer.

1.3 The signalling requirements for PBXs in a Network which supports interworking between Digital Private Network Signalling System No 1 (DPNSS 1), Public Access and other Private Network signalling systems are detailed in this specification and in DPNSS[189-I].

1.4 The Physical Characteristics (Layer 1) and Link Access Protocol (Layer 2) requirements of DPNSS 1 are unchanged for the purpose of interworking and are detailed in DPNSS[188].

1.5 The Layer 3 requirements of DPNSS 1 when interworking with other signalling systems are shown in this specification.

1.6 This specification is structured such that SECTIONS 3, 4 and 5 specify the essential core of the interworking requirements including common procedures.

1.7 Each section, from SECTION 6 onwards, deals with interworking for a DPNSS 1 service. Interworking with specific signalling systems is shown in separate Paragraphs within these sections.

1.8 SECTION 6 details a Simple Telephony call; if interworking with another signalling system is provided then the Simple Telephony Call is a minimum requirement.

2 GLOSSARY OF TERMS

The glossary for DPNSS 1 appears in SECTION 1 of DPNSS[188].

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 3 - GATEWAY PBX REQUIREMENTS

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HISTORY

Issue 1 - July 1984
Issue 2 - May 1985
Issue 3 - March 1988

Issue 4 - December 2001 - Specification renamed as DPNSS[189]
- Reference to DASS 2 Subset removed
- References to specific PSTN, Decadic and SSMF5 specifications removed

REFERENCES

DPNSS[188] Global Issue 7
DPNSS[189-I] Global Issue 2
BTNR 190 Issue 2

1 GENERAL

1.1 This specification details the interworking requirements for providing Simple Telephony Calls and, where appropriate, Supplementary Services between DPNSS 1 routes and routes supported by signalling systems of the types described in this section. Interworking between DPNSS 1 and ETSI ISDN signalling systems is described in a separate specification, DPNSS[189-I].

1.2 The interworking point between the two signalling systems is, for the purpose of this specification, termed the Gateway PBX.

1.3 For a Gateway PBX to provide interworking between DPNSS 1 and another signalling system, it must be capable of sending and receiving the necessary signals/messages of both signalling systems to establish a call.

1.4 Additionally:

A Gateway PBX to another signalling system must be capable of responding to an EEM containing TRFD with an EEM containing the CLC of the signalling system (eg PSTN, DEC) and optionally the CLI.

If a Gateway PBX to another signalling system receives an EEM containing a CLC (eg a Gateway to the PSTN receives an EEM containing CLC-PSTN) it should take care that it does not allow connection of the call if the connection does not comply with the current regulatory rules of the country concerned.

1.5 The signalling procedures of the other signalling systems are unaffected by interworking with DPNSS 1.

The procedures of DPNSS 1 itself are modified when interworking with some signalling systems.

These changes are detailed in SECTION 6 onwards of this specification.

1.6 Interworking between DPNSS 1 and signalling systems other than those specified in this specification may be possible. Their exclusion from this specification and from DPNSS[189-I] does not imply that an interworking facility cannot be achieved.

2 REQUIREMENTS FOR DPNSS 1

The Layer 2 (Link Access Protocol) requirements for DPNSS 1 are detailed in DPNSS[188] SECTION 3.

Changes to the Layer 3 requirements from the normal DPNSS 1 signalling protocols are shown in each individual Section of this specification.

3 REQUIREMENTS FOR THE OTHER SIGNALLING SYSTEMS

The Layer 2 and Layer 3 requirements for DASS 2 are shown in BTNR 190.

DASS 2 supports its own set of Supplementary Services. Where possible these Supplementary Services have been mapped onto DPNSS 1 as described in later Sections of this specification. However, there are DASS 2 Supplementary Services which have no DPNSS 1 equivalent. Also the possibility exists that a PBX which supports a DASS 2 Supplementary Service may not support the equivalent DPNSS 1 Supplementary Service. In cases where the Gateway PBX receives DASS 2 signalling and cannot pass any corresponding information on, via DPNSS 1, the Gateway PBX must handle the DASS 2 signalling in accordance with the relevant section of BTNR 190 by treating the DPNSS 1 channel as a DASS 2 destination which cannot take part in the DASS 2 Supplementary Service.

PSTN, Private Decadic and SSMF5 signalling systems are treated generically in this specification.

The requirements for the electrical conditions and signalling protocols for a particular interface shall be in accordance with the relevant specification.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 4 - MESSAGE CONTENTS

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HISTORY

Issue 1 - July 1984
Issue 2 - May 1985
Issue 3 - March 1988

Issue 4 - December 2001 - Specification renamed as DPNSS[189]
- Annex 1 and 2 removed to DPNSS[188]

REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

All requirements relating to the coding of DPNSS 1 Messages and Message Contents are specified in DPNSS[188], SECTION 4.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 5 - GENERAL SIGNALLING PROCEDURES

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HISTORY

Issue 1 - July 1984
Issue 2 - May 1985
Issue 3 - March 1988

Issue 4 - December 2001 - Specification renamed as DPNSS[189]
- Subsections restructured
- Unused references removed

REFERENCES

DPNSS[188] Global Issue 7
DPNSS[189-I] Global Issue 2
BTNR 190 Issue 2

1 GENERAL

1.1 The level 3 signalling procedures detailed in this specification are considered in two parts:

i) General signalling procedures that are common to all services

ii) The signalling procedures for each individual service

The requirements of i) are given in this Section of this specification; the signalling procedures for each service ii) are given in separate Sections of this specification, commencing at SECTION 6.

Layer 3 signalling procedures for interworking between DPNSS 1 and other signalling systems covered by this specification are defined by the details given in SECTION 6 onwards of this specification, in conjunction with the general signalling procedures of the other signalling systems.

NOTE: The interworking between DPNSS 1 and ETSI ISDN signalling systems is described in a separate specification, DPNSS[189-I].

1.2 Subsection 2 describes the conventions used for the specification of Layer 3 procedures used in SECTION 6 onwards of this specification.

1.3 Subsection 3 describes the general signalling procedures applicable for interworking with other signalling systems.

2 SPECIFICATION FORMAT

2.1 SERVICE SECTION FORMAT

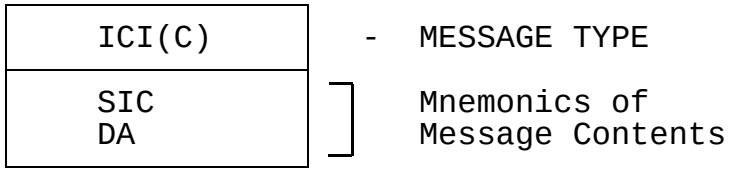
The Service Sections (SECTION 6 onwards) are written to a standard format as follows:

- a separate Subsection is allocated to each signalling system for which interworking with DPNSS 1 is described;
- each Subsection begins with a definition of the interworking to be described;
- an Outline of Operation indicates a breakdown of the description into separate aspects of the interworking;
- each aspect of interworking is described by means of explanatory text supported by Message Sequence Diagrams (MSDs).

2.2 MSD SYMBOLS

The Message Sequence Diagrams conform to a standard layout and use the following symbols and conventions:

2.2.1 DPNSS 1 and DASS 2 Messages



Coding details for and the meaning of the mnemonics relating to DPNSS 1 Messages are given in SECTION 4 of DPNSS[188].

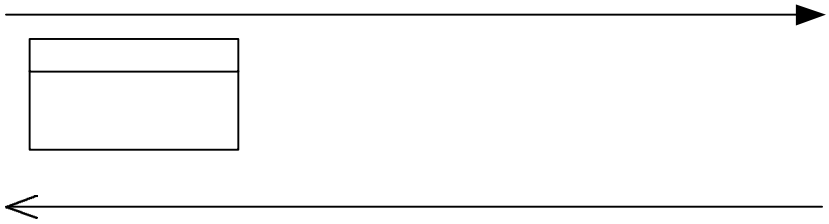
Coding details for and the meaning of the mnemonics relating to DASS 2 messages are given in BTNR 190.

2.2.2 PSTN, Decadic and SSMF5 Signals

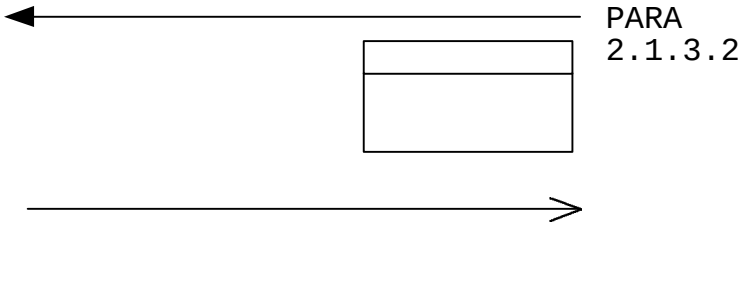
A signal used on an Incoming or Outgoing Junction to or from a Gateway PBX. The name of the actual signal used is shown above the signal arrow.

For details of the signals see the relevant signalling specification.

2.2.3 Signalling Flow



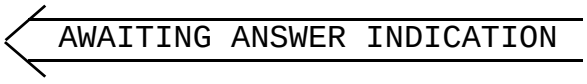
2.2.4 Reference to Text for Explanation of PBX Action and Possible Alternative Sequences



References are to paragraphs within the same Section as the MSD unless specifically indicated by a prefix, eg:

AS FOR SECTION 6 PARA. 2.1.1.2	or	AS FOR DPNSS[188] SECTION 6 PARA. 2.3.2.1

2.2.5 An Audible Supervisory Indication



2.2.6 Connection State of a Traffic Channel

2.3 TEXT AND MSD CONVENTIONS

2.3.1 Terminology

The terminology used throughout this specification is based on the standards set in DPNSS[188], DPNSS[189] and DPNSS[189-I] for text relating to DPNSS 1 signalling; text relating to other signalling systems adopts the style and nomenclature of the relevant signalling systems.

2.3.2 ISRM Convention

In the text and MSDs the use of the term "ISRM" indicates that either a single ISRM(C), a single ISRM(I) or an ISRM(I) followed by one or more SSRMs [the last of which may be an SSRM(C)] may be used to convey the contents of the Selection Block.

The use of the term "ISRM(C)" represents either a single ISRM(C) or an ISRM(I) followed by one or more SSRMs, the last of which is an SSRM(C).

The use of the term "ISRM(I)" represents either a single ISRM(I) or an ISRM(I) followed by one or more SSRM(I)s.

The use of the term "SSRM(I)" represents either a single SSRM(I) or a sequence of SSRM(I)s.

The use of the term "SSRM(C)" represents either a single SSRM(C) or a sequence of one or more SSRM(I)s followed by an SSRM(C).

2.4 SDL DIAGRAMS

The SDL conventions used for the description of DPNSS 1 are detailed in DPNSS[188] SECTION 5. The SDL given in this specification forms a part of the DPNSS 1 Service Process.

SDL diagrams covering DPNSS 1 interworking for a Simple Telephony Call are given in SECTION 6 of this specification.

SDL diagrams for Supplementary Service interworking are not shown.

3 PBX FUNCTIONS AND GENERAL SIGNALLING PROCEDURES

3.1 DPNSS 1

3.1.1 The handling of messages and message contents, and the control of simple circuit switched calls, on the DPNSS 1 side of a Gateway PBX shall be as defined in DPNSS[188] and DPNSS[189-I], and shall be in addition to those Interworking Procedures that are supported by the Gateway PBX.

3.1.2 Any exceptions to signalling procedures occurring on interworking for particular Services are detailed in the MSDs and explanatory text which specify those Services in this specification.

3.1.3 Where a Supplementary Service is not supported by a Gateway PBX the DPNSS 1 Channel Process will handle the Supplementary Information Strings as unrecognised (see DPNSS[188] SECTION 5). Subject to the String suffix, the call will either be rejected or the unrecognised String will be discarded and the call presented to the Service Process as an interworking Simple Telephony Call.

3.1.4 During the signalling for any Service an Originating or Terminating PBX may receive a message containing CLC-PSTN, CLC-DEC, CLC-ISDN, or CLC-MF5. In this case it must use that information to determine whether any special action is required on the call eg bar the call, connect the caller to an Operator etc. If no special action is required the PBX will process the message as if it contained the Calling Line Category - Ordinary (CLC-ORD).

In the case of CLC-PSTN or CLC-ISDN the action to be taken may be influenced by the Government regulations of the Country concerned.

3.2 DASS 2

The handling of messages and message contents, and the control of simple circuit switched calls, on the DASS 2 side of a Gateway PBX shall be as defined in the DASS 2 specification.

The signalling procedures for DASS 2 are detailed in BTNR 190 Issue 2.

3.3 PSTN

PSTN interworking is described in this specification in terms of interworking with a loop disconnect signalling system that connects a PBX to the public network. The interworking principles are intended, however, to be applicable when interworking with any public access signalling system that is similar in nature.

The handling of signalling, and the control of simple circuit switched calls, on the PSTN side of a Gateway PBX shall be as defined in the appropriate PSTN signalling specification.

3.4 Decadic

Decadic interworking is described in this specification in terms of interworking with a 10pps signalling system that connects a PBX to another PBX over a private circuit. The interworking principles are intended, however, to be applicable when interworking with any inter-PBX signalling system that is similar in nature.

The handling of signalling, and the control of simple circuit switched calls, on the Decadic side of a Gateway PBX shall be as defined in the appropriate Decadic signalling specification.

3.5 SSMF5

SSMF5 interworking is described in this specification in terms of interworking with a compelled inter-register signalling system that connects a PBX to another PBX over a private circuit. The interworking principles are intended, however, to be applicable when interworking with any inter-PBX signalling system that is similar in nature.

The handling of signalling, and the control of simple circuit switched calls, on the SSMF5 side of a Gateway PBX shall be as defined in the appropriate SSMF5 signalling specification.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 6 - SIMPLE TELEPHONY CALL

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HISTORY

Issue 1 - July 1984
Issue 2 - May 1985
Issue 3 - March 1988

Issue 4 - December 2001 - Specification renamed as DPNSS[189]
- Unused references removed
- Reference to use of ISDN interworking strings added

REFERENCES

DPNSS[188] Global Issue 7
DPNSS[189-I] Global Issue 2
BTNR 190 Issue 2

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for Simple Telephony Calls.

1.2 Subsection 2 details Simple Telephony calls when DPNSS 1 interworks with other signalling systems.

1.3 The description is given in the form of Message Sequence Diagrams (MSDs) followed by explanatory text.

1.4 Alternative action (eg for unsuccessful calls) not shown in MSDs is included in the text. The text is referred to in MSDs at appropriate points in the sequences.

1.5 Subsection 3 details the service in SDL format.

1.6 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

This Paragraph deals only with a Simple (Automatic) Telephony call between an extension within a DPNSS 1 Private Network and a telephony terminal within the PSTN.

OUTLINE OF OPERATION

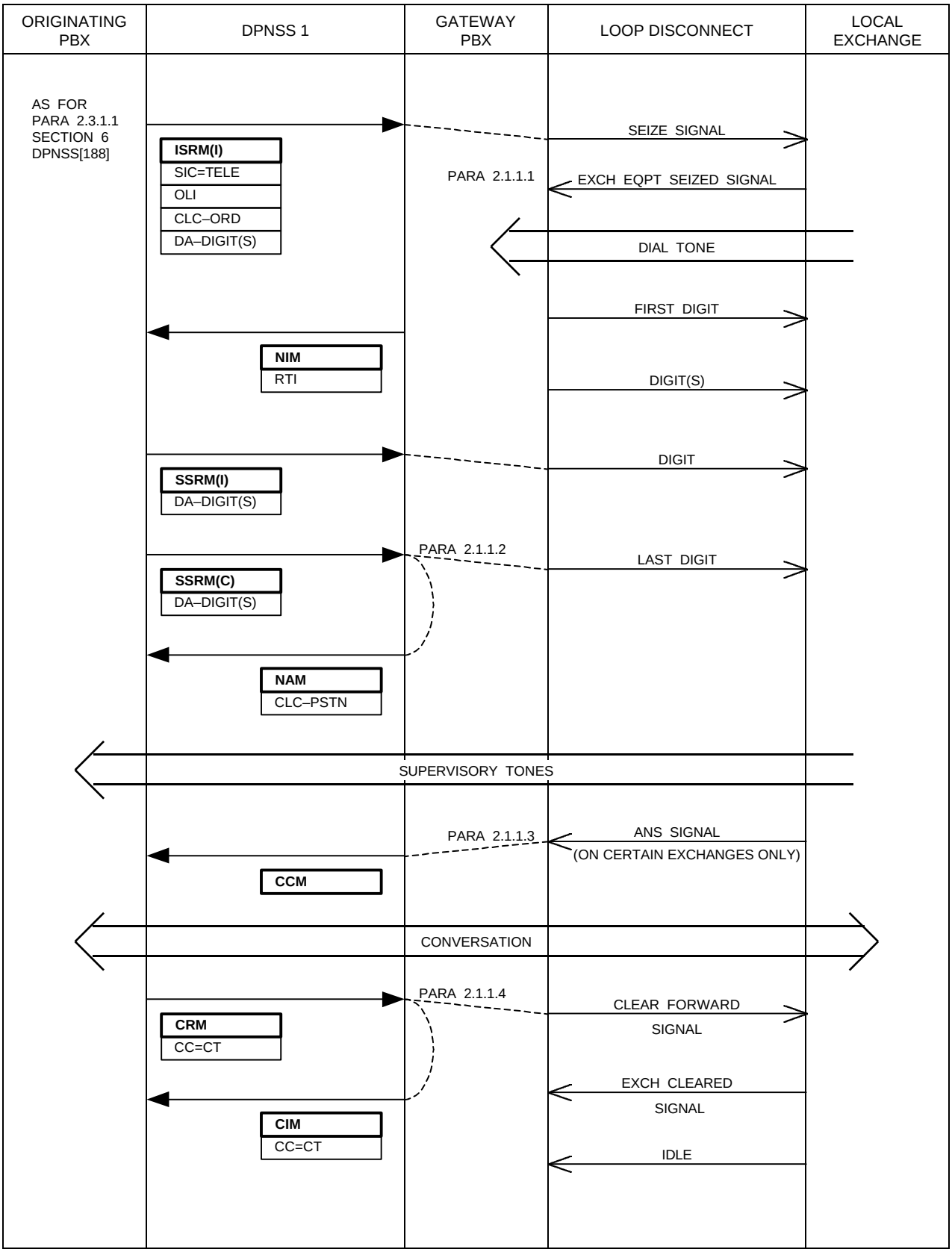
The signalling procedures are divided into three parts:

2.1.1 A Simple Call from a DPNSS 1 extension to the PSTN

2.1.2 A Simple Call from the PSTN (DDI) to a DPNSS 1 extension.

2.1.3 A Simple Call from the PSTN (Non-DDI) to a DPNSS 1 extension.

2.1.1 SIMPLE CALL FROM A DPNSS 1 EXTENSION TO THE PSTN



2.1.1.1 When the Destination Address within an ISRM(C) or ISRM(I) plus one or more SSRMs identifies an outgoing PSTN route, the Gateway PBX selects a free PSTN line and sends a Seizing Signal to the Local Exchange.

If CLC-ORD (PSTN barred) is contained in the ISRM the call should not be allowed and a CRM containing the Clearing Cause: AB shall be sent to the Originating PBX.

The Local Exchange will return an 'Exchange Equipment Seized' Signal followed by dial tone. The dial tone may be blocked at the Gateway PBX. Alternatively, the transmission path may be connected so that the caller may hear the tone. This is dependent on the design of the Gateway PBX.

The Gateway PBX will send the PSTN Destination Address to the PSTN digit by digit in accordance with the appropriate specification.

A NIM, containing RTI indicating PSTN encountered, should be sent as soon as possible to indicate that the call is being made to the PSTN.

If the PSTN route is an alternative route the RTI string should also indicate Alternative Route.

The transmission path should be connected through as soon as possible thus enabling the caller to hear any supervisory tones returned from the PSTN.

In the event of all PSTN lines from the Gateway PBX being busy and no alternative route being available or acceptable the call will be cleared by sending a CRM containing the Clearing Cause: CON. A CIM should be expected in response.

2.1.1.2 Once end of selection has been determined, by receipt of either an ISRM(C) or an SSRM(C) or a Timeout, whichever is the sooner, a NAM will be returned. The NAM shall be sent without unnecessary delay in order to prevent any timeouts that are based on end of selection from expiring elsewhere in the private network (eg at the originating PBX) or outside the private network (eg in the ISDN). This NAM should contain the CLC-PSTN and optionally the Trunk Identity (TID) indicating the Trunk Number.

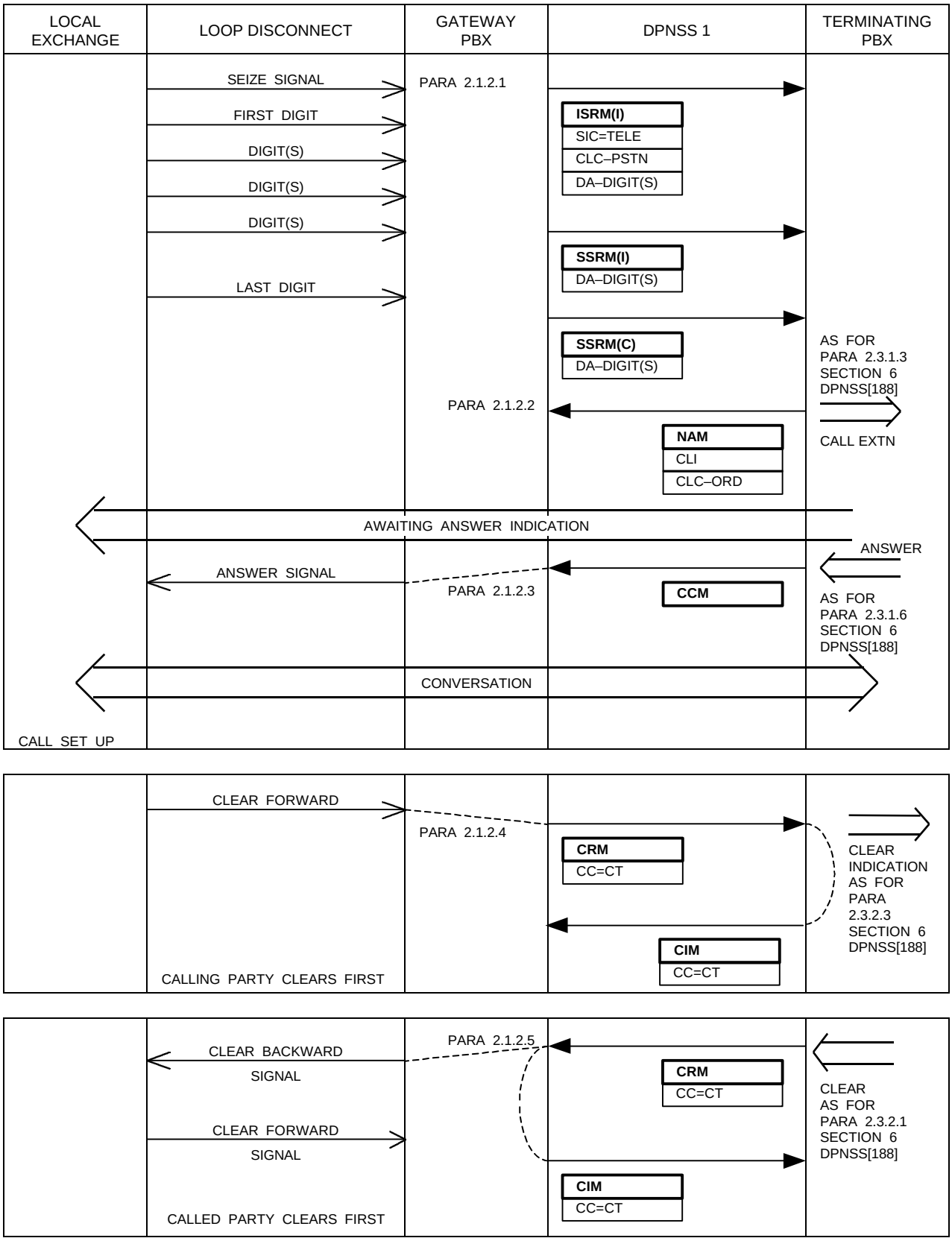
NOTE: PBXs manufactured to earlier issues of this specification may use the CLI string to indicate the Trunk Number.

2.1.1.3 If an Answer signal is received from the PSTN a CCM shall be sent on the DPNSS 1 signalling channel.

Where no Answer signal is available but SPM signals are available the first meter pulse may be used to generate a CCM. If neither an Answer signal nor SPM is available a CCM containing SIM-A will be sent after sending the NAM (eg 60 seconds after sending the NAM).

2.1.1.4 Normally the clearing of outgoing PSTN calls is under the control of the originating party. However in the case where the PSTN provides a Clear Back signal the Gateway PBX, on receipt of this signal, may initiate clearing of the call through the DPNSS 1 network in the backward direction.

2.1.2 SIMPLE CALL FROM THE PSTN (DDI) TO A DPNSS 1 EXTENSION



2.1.2.1 When an incoming PSTN DDI call arrives and digit analysis indicates a DPNSS 1 route within a Private Network, a transmission channel is reserved and an ISRM is sent on the signalling channel.

The ISRM contains the Service Indicator Code=TELE, Calling Line Category-PSTN, Destination Address and optionally the Trunk Identity (TID) indicating the trunk number.

NOTE: PBXs manufactured to earlier issues of this specification may use the OLI string to indicate the Trunk Number.

Whenever possible an ISRM(C) should be used. However where the possibility of interworking with a slower speed signalling system exists, or the Gateway does not know the number length (either of which could result in excessive post dialling delays) an ISRM(I) may be used together with one or more SSRMs to send the Destination Address digits. If the End-of-Selection is recognised by the Gateway PBX (eg register timeout) before a NAM is received, then an SSRM(C) is used to indicate the end of selection information.

In order that any supervisory indications or verbal announcements may be heard by the caller the transmission path should be switched through as soon as possible.

2.1.2.2 Receipt of a NAM containing no Supplementary Information other than CLC and CLI indicates a successful routing within the DPNSS 1 Network and that Supervisory tones are being returned in the traffic channel. No further SSRMs should be sent following receipt of the NAM.

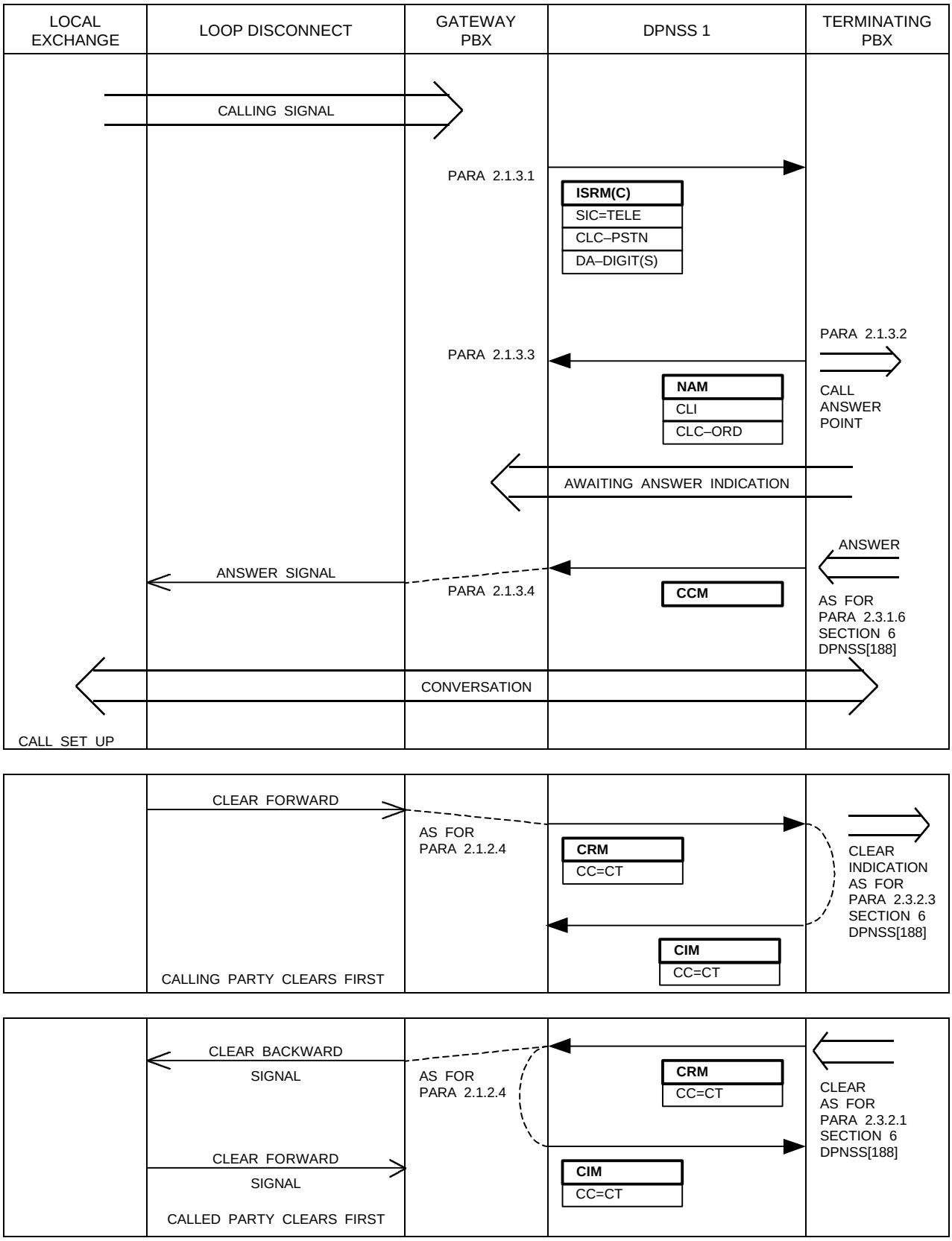
In the case of call failure within the DPNSS 1 network a CRM with the appropriate Clearing Cause will be used to drop the call back to the Gateway PBX from which an appropriate call failure tone will be applied to the incoming PSTN line. When a CRM is received, a CIM will be sent in response.

2.1.2.3 On receipt of a CCM the Gateway PBX applies an Answer Signal to the incoming PSTN line.

2.1.2.4 On Receipt of a Clear Forward Signal, the Gateway PBX shall release the switched path and send a CRM in the signalling channel containing a Clearing Cause: CT. A CIM is expected in response.

2.1.2.5 On receipt of a CRM from the destination PBX the Gateway shall return a CIM and apply a Clear Back Signal to the incoming line.

2.1.3 SIMPLE CALL FROM THE PSTN (NON–DDI) TO A DPNSS 1 EXTENSION



2.1.3.1 When a Calling Signal (Ringing Current) is received, on a Non-DDI incoming PSTN line, the Gateway PBX routes the call to a previously determined Answer Point. If the Answer Point is on the Gateway PBX there is no DPNSS 1 involved. If the Answer Point (normally an Operator position) is on another PBX a call is made to the Answer Point by sending an ISRM on the signalling channel. It should be noted that, since the line is free at the Local Exchange, Ringing Tone will be sent to the calling party. Therefore if the Answer Point is off PBX care should be taken to ensure that the call has a good chance of being successful.

The ISRM contains a Service Indicator Code (SIC), the CLC-PSTN with the Status Parameter set to Non-DDI, the TID indicating the Trunk Number (if available), and the Destination Address of the Answer Point.

NOTE: PBXs manufactured to earlier issues of this specification may use the OLI string to indicate the Trunk Number.

The transmission path shall not be switched through beyond the Gateway PBX.

2.1.3.2 The call shall be dealt with as detailed in DPNSS[188] SECTION 6 Paragraph 2.3.1.3, except that the Non-DDI status information may cause special action to take place eg Call Waiting etc.

2.1.3.3 Receipt of a NAM containing no Supplementary Information other than CLC and CLI indicates a successful call.

In the case of call failure within the DPNSS 1 network a CRM with the appropriate Clearing Cause will be used to drop the call back to the Gateway PBX. The Gateway PBX should then redirect the call to an alternative Answer Point.

2.1.3.4 On receipt of a CCM the Gateway PBX shall apply an Answer Signal to the incoming PSTN line and switch through the transmission path.

2.2 INTERWORKING WITH DASS 2

This Paragraph deals with a simple automatic telephony call between an extension within a DPNSS l Private Network and DASS 2.

Attention is drawn to Paragraph 1.10 of Section 1 of DPNSS[189-I] which permits the use of Supplementary Information Strings defined for interworking with ISDN signalling protocols to be used in conjunction with other signalling systems with similar characteristics. In particular these Strings may be used instead of, or as well as, the BSS and D-SIC Strings explicitly mentioned below to aid in the mapping between DPNSS 1 and DASS 2 Service Indicator Codes.

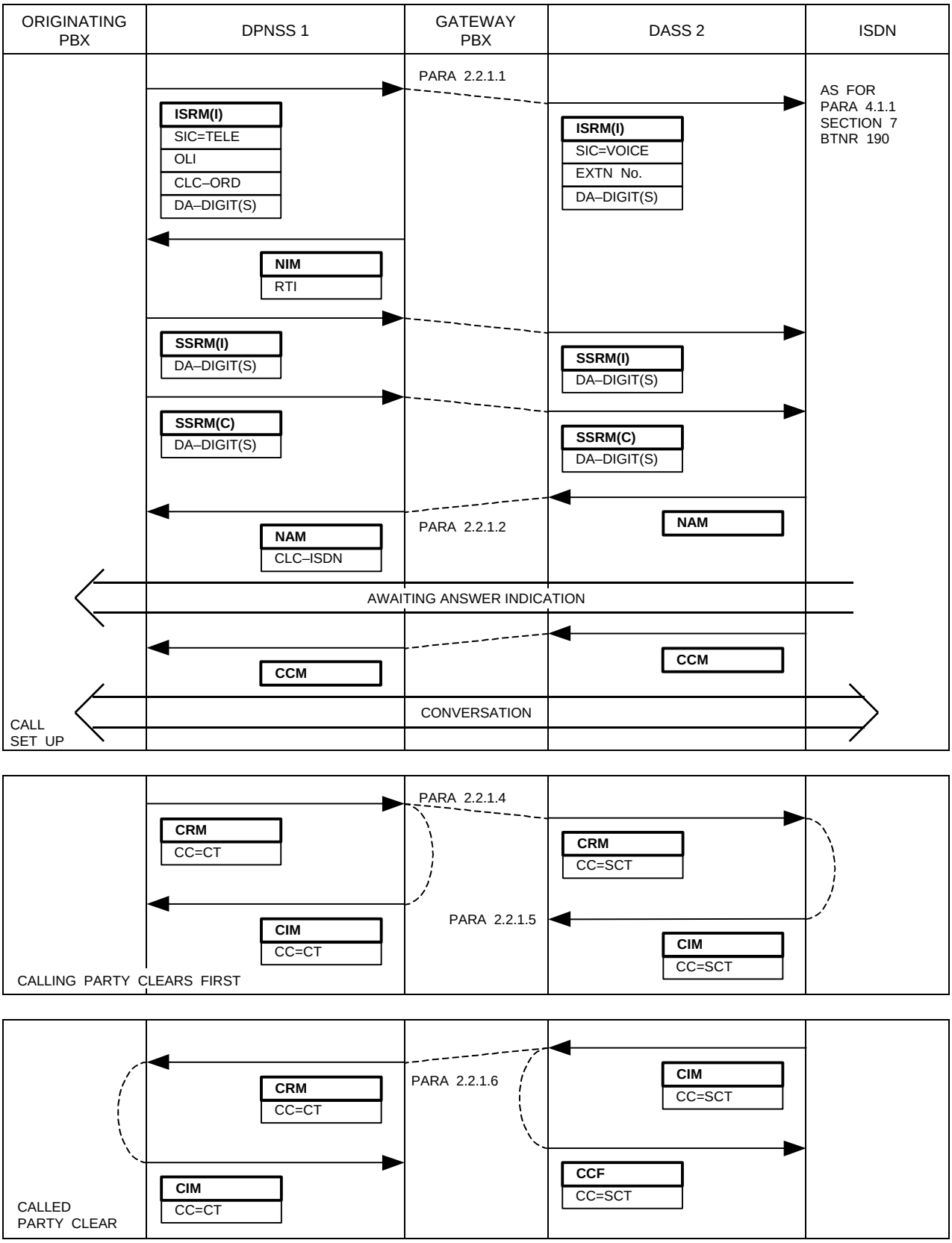
OUTLINE OF OPERATION

The signalling procedures are divided into two parts:

2.2.1 A Simple Call from a DPNSS l extension to DASS 2.

2.2.2 A Simple Call from DASS 2 to a DPNSS l extension.

2.2.1 SIMPLE TELEPHONY CALL FROM A DPNSS 1 EXTENSION TO DASS 2



2.2.1.1 When the Destination Address within an ISRM identifies an outgoing DASS 2 route the Gateway PBX reserves a traffic channel to the local exchange and sends a DASS 2 ISRM on the signalling channel. The Gateway PBX returns a NIM with Routing Information (RTI) indicating public ISDN encountered.

The DASS 2 ISRM, in accordance with BTNR 190, contains a SIC, the calling extensions DDI identity if available and the Destination Address of the required terminal. The Calling Extensions DDI identity is coded as for the OLI as shown in BTNR l90 and must not exceed 6 digits.

If the CLC-ORD (Service Marking Parameter set to PSTN barred) is contained in the ISRM, the call should not be allowed and a CRM containing the Clearing Cause: AB is sent to the Originating PBX. A CIM is expected in response.

NOTE: On receipt of an SIC=TELE in the DPNSS l ISRM, the Gateway PBX will make a Category 2 Voice call on DASS 2. However if the DPNSS 1 ISRM contains Supplementary Information Strings BSS or D-SIC then reference should be made to SECTIONS 18 or 16 of this specification.

Whenever possible a DASS 2 ISRM (Complete) should be used. However, where the number length is not known a DASS 2 ISRM (Incomplete) may be used together with one or more Subsequent Service Request Messages (SSRMs) to send the remaining address information.

If a DASS 2 ISRM with no Selection Block is sent, a Proceed Indication (Dial Tone) will be received and may be blocked by the Gateway PBX. In this case the calling extensions DDI identity and the Destination Address are sent in SSRMs.

In order that any supervisory indications or announcements are returned to the Originating user the transmission path should be connected through as soon as possible.

2.2.1.2 A DASS 2 NAM will be received if the Public Network call succeeds or fails. However in the event of call failure the NAM will contain the End of Call (EOC) String, the Parameter of which is the Clearing Cause. On receipt of a DASS 2 NAM which does not contain EOC the Gateway PBX sends a DPNSS l NAM to the Originating PBX containing CLC-ISDN and optionally the Trunk Identity (TID). If the DASS 2 Calling Line Identity (CLI) service is subscribed to by the calling party, the DASS 2 NAM will contain the Terminating Line Identity (TLI) of the called party.

If a TLI containing other than the single character "X" is received in the DASS 2 NAM then it shall be copied into a CLI string in the DPNSS 1 NAM. If the DASS 2 TLI contains any "X" character(s) they shall be discarded.

It should be noted that a CLI in a DPNSS 1 NAM that also contains a CLC-ISDN will represent the Destination Address within the public network. This CLI cannot therefore be used, unchanged, as a Destination Address within the DPNSS 1 network.

If a DASS 2 CIM is received in response to the DASS 2 ISRM then a DASS 2 CCF shall be returned and the DPNSS 1 path shall be cleared by sending a CRM containing Clearing Cause: NT.

If the call is not entirely across a 64kbit/s path within the Public Network, receipt of a DASS 2 NAM does not imply that the called party is free. In this case the call state will be indicated by an associated supervisory tone in the transmission channel. The Gateway PBX sends a DPNSS 1 NAM containing CLC-ISDN to the calling PBX. If the tone received indicates that the call is unsuccessful then the responsibility of clearing the call is left to the calling party.

On receipt of the DASS 2 NAM containing EOC the Gateway PBX sends a DPNSS 1 CRM towards the Originating PBX. Except in the cases shown below the DASS 2 Clearing Cause contained in the EOC String shall be used as the DPNSS 1 Clearing Cause:

EOC String Parameter	**DPNSS 1 Clearing Cause**
Message Not Understood	Network Termination
Service Incompatible	Subscriber Incompatible
Signal Not Understood	Network Termination

NOTE: In view of the above not all Clearing Causes received by DPNSS 1 PBXs will be genuine DPNSS 1 Clearing Causes. However, Originating PBXs, having earlier received RTI indicating public ISDN encountered, may thus be able to interpret the DASS 2 Clearing Causes correctly.

The Indication field of the DPNSS 1 CRM may convey the textual display provided by String "AA" in the DASS 2 NAM. The Supplementary Information Identifier *AA* is converted to *l00* at the Gateway PBX.

A DASS 2 CRM containing the same Clearing Cause as that received in the EOC String is sent to the Local Exchange.

A CIM is expected on both the DASS 2 and DPNSS l paths in response to the CRMs.

2.2.1.3 On receipt of a DASS 2 CCM (Answer) the Gateway PBX sends a DPNSS l CCM to the Originating PBX.

If the call is not entirely across a 64kbit/s path the CCM will contain the Textual Display information 'Not Suitable for Data' coded as shown in BTNR l90 SECTION 4.

NOTE: *AA*Not Suitable For Data# on DASS 2 becomes *l00*Not Suitable For Data# on DPNSS l.

2.2.1.4 When the caller clears the DPNSS l links will be released in the normal way with an exchange of CRM and CIM. The Gateway PBX on receipt of a DPNSS l CRM sends a DASS 2 CRM containing the Clearing Cause: SCT. The DASS 2 code for Clearing Cause: SCT is the same as the DPNSS 1 Clearing Cause: CT.

2.2.1.5 The Gateway PBX must retain the address of the now cleared DPNSS l extension until the DASS 2 CIM is received in case the Public Network wishes to hold the connection (eg to provide the Supplementary Service: Call Charge Indication).

Refusal by the Public Network to allow release of the call is indicated by the Local Exchange delaying sending of the DASS 2 CIM in response to the DASS 2 CRM.

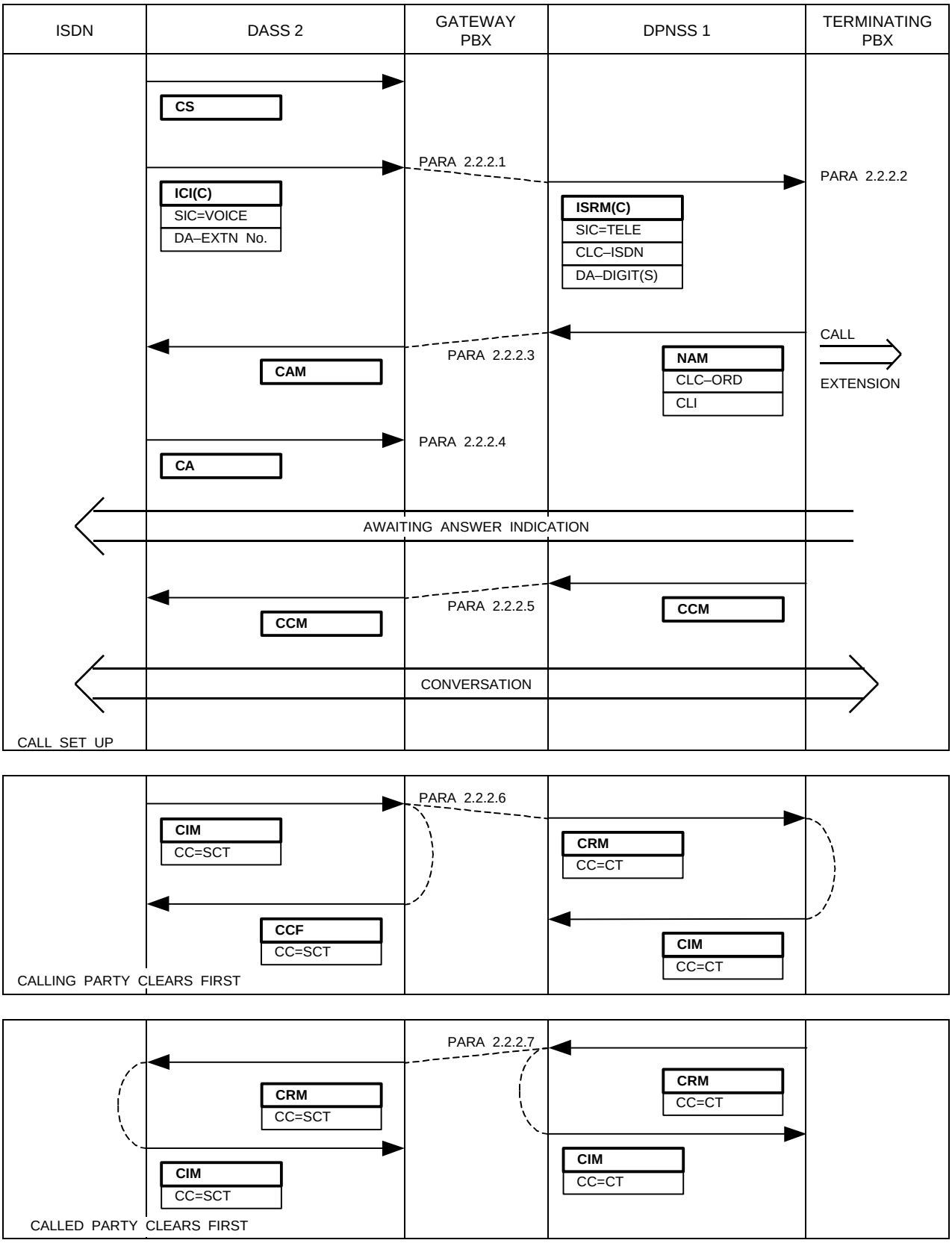
2.2.1.6 Receipt of a DASS 2 CIM indicates that the call has been released by the Public Network following a clear by the called party, and subsequent CSH timeout expiry.

The Gateway PBX will return CCF to the Local Exchange and release the DPNSS 1 link by sending a CRM containing the Clearing Cause received from DASS 2.

A CIM will be expected in response.

NOTE: If the Clearing Cause: INC is received by the Gateway PBX from DASS 2 the CRM sent on the DPNSS 1 path should contain the Clearing Cause: SI.

2.2.2 SIMPLE TELEPHONY CALL FROM DASS 2 TO A DPNSS 1 EXTENSION



2.2.2.1 On receipt of a Channel Seize (CS) message, the Gateway PBX reserves the transmission channel.

When the DDI digits in the DASS 2 ICI(C) or an ICI(I) and any SSRMs identify an outgoing DPNSS l route the Gateway PBX reserves a transmission channel on the required route and sends a DPNSS l ISRM on the signalling channel.

If the ICI has no Destination Address the call shall be routed to a NON DDI Answer Point which has been previously arranged. The Destination Address in the DPNSS 1 ISRM will be the Private Network number of the Answer Point.

The DPNSS l ISRM contains the SIC, the Destination Address and the Calling Line Category CLC-ISDN.

In addition if an OLI String containing other than the single character "X" is received from DASS 2, It shall be copied into an OLI String in the DPNSS 1 ISRM. If the DASS 2 OLI contains any "X" characters they shall be discarded.

It should be noted that an OLI in a DPNSS 1 ISRM that also contains a CLC-ISDN will represent the Destination Address within the public network. This OLI cannot therefore be used, unchanged, as a Destination Address within the DPNSS 1 network.

A Trunk Identity String (TID) may optionally be included in the DPNSS 1 ISRM.

NOTE: Four types of Voice call may be requested by DASS 2:

- Category 1 Voice - SIC = 00010010
- Category 2 Voice - SIC = 00010000
- 3.1kHz Audio - SIC = 10011NNN NNNNNNNN
- TELE - SIC = 00000000

DPNSS 1 has only one type of Voice call:

- TELE - SIC = 00010000

However the BSS Supplementary Information String specified in Bearer Service Selection and the D-SIC String specified in Service Independent Strings may be used to supplement the DPNSS 1 SIC.

When the Gateway PBX receives a DASS 2 Category 1 Voice call it sends a DPNSS 1 ISRM containing the SIC=TELE. The route within DPNSS 1 must be a fully 64kbit/s path, and where a Private Network contains a mixture of analogue and digital routes Bearer Service Selection must be used as described in SECTION 18 (ie BSS-M). If the Gateway PBX cannot select a 64 kbit/s path or does not support Bearer Service Selection as an Originating PBX, it shall clear the call by sending a DASS 2 CRM containing the Clearing Cause: SI, and expect a CIM in response.

When the Gateway PBX receives a DASS 2 Category 2 call it sends a DPNSS 1 ISRM containing the SIC=TELE. Ideally the route within DPNSS 1 will be a fully 64kbit/s path, and where a Private Network contains a mixture of analogue and digital routes Bearer Service Selection may be used as described in SECTION 18 to indicate that a digital path is preferable (ie BSS-P).

When the Gateway PBX receives a DASS 2 Telephony call it sends a DPNSS 1 ISRM containing the SIC=TELE. The route within DPNSS 1 may be either analogue or digital.

When the Gateway receives a DASS 2 3.1kHz Audio Call it sends a DPNSS 1 ISRM containing the SIC=TELE. The route chosen within the DPNSS 1 network will be either an analogue circuit or a digital channel with the ability to support A-Law PCM speech.

Where transfer of the data characteristics contained in the DASS 2 SIC is required the D-SIC string may be used as described in SECTION 16 of this specification.

2.2.2.2 On receipt of an ISRM (C) or an ISRM (I) plus any SSRMs containing the CLC-ISDN, the Terminating PBX shall proceed as shown in DPNSS[188] SECTION 6, Paragraph 2.3.1.3.

2.2.2.3 On receipt of a DPNSS l NAM the Gateway PBX sends a DASS 2 Call Accepted Message (CAM) to the Local Exchange to indicate that the requested extension is compatible and free. The DDI extension number of the called party is contained in the DASS 2 CAM, coded as shown in BTNR 190.

On receipt of a DPNSS l CRM indicating call failure, a CIM is returned to the Terminating PBX and a DASS 2 CRM is sent. The mapping between the DPNSS 1 Clearing Cause and the DASS 2 Clearing Cause is shown in the following table. A CIM is expected in response from the Public Network.

DPNSS 1 Clearing Cause	DASS 2 Clearing Causes
Subscriber Incompatible	Service Incompatible
Congestion	Subscriber Engaged
Busy	Subscriber Engaged
Service Incompatible	Service Incompatible
NAE Error	NAE Error
DTE Controlled Not Ready	DTE Controlled Not Ready
DTE Uncontrolled Not Ready	DTE Uncontrolled Not Ready

Any DPNSS 1 Clearing Causes that are not listed above shall be mapped onto the DASS 2 Clearing Cause: NU except in the following cases.

If the DPNSS 1 CRM contains CC: SU accompanied by String SU with parameter BSS-M then, the DASS 2 Clearing Cause shall be Service Incompatible.

If the DPNSS 1 CRM contains CC: SNU accompanied by String SNU with parameter BSS-M, then the DASS 2 Clearing Cause shall be Service Incompatible.

2.2.2.4 The Local Exchange connects the call and sends a Call Arrival (CA) message. The Gateway PBX merely notes receipt of this message.

2.2.2.5 When the called extension answers, the Terminating PBX sends a DPNSS l CCM. The Gateway PBX repeats this information as a DASS 2 CCM. If a DASS 2 Call Arrival message (CA) has not been received the DASS 2 CCM must be withheld until the CA is received.

2.2.2.6 On Receipt of a DASS 2 CIM the Gateway PBX returns a DASS 2 CCF. The DPNSS 1 path will be released in the normal way (as in DPNSS[188]) with an exchange of CRM and CIM.

2.2.2.7 When the called party clears, the DPNSS l path will be released in the normal way (as in DPNSS[188]) with an exchange of CRM and CIM. The Gateway PBX on receipt of the DPNSS l CRM sends a DASS 2 CRM and expects a DASS 2 CIM in response.

NOTE: If the Clearing Cause: SI is received by the Gateway PBX at any time from the DPNSS 1 path, the CRM sent on the DASS 2 path should contain the Clearing Cause: SI.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

This Paragraph deals only with a simple automatic telephony call between an extension within a DPNSS 1 part of a Private Network and a telephony terminal within a Decadic part of a Private Network.

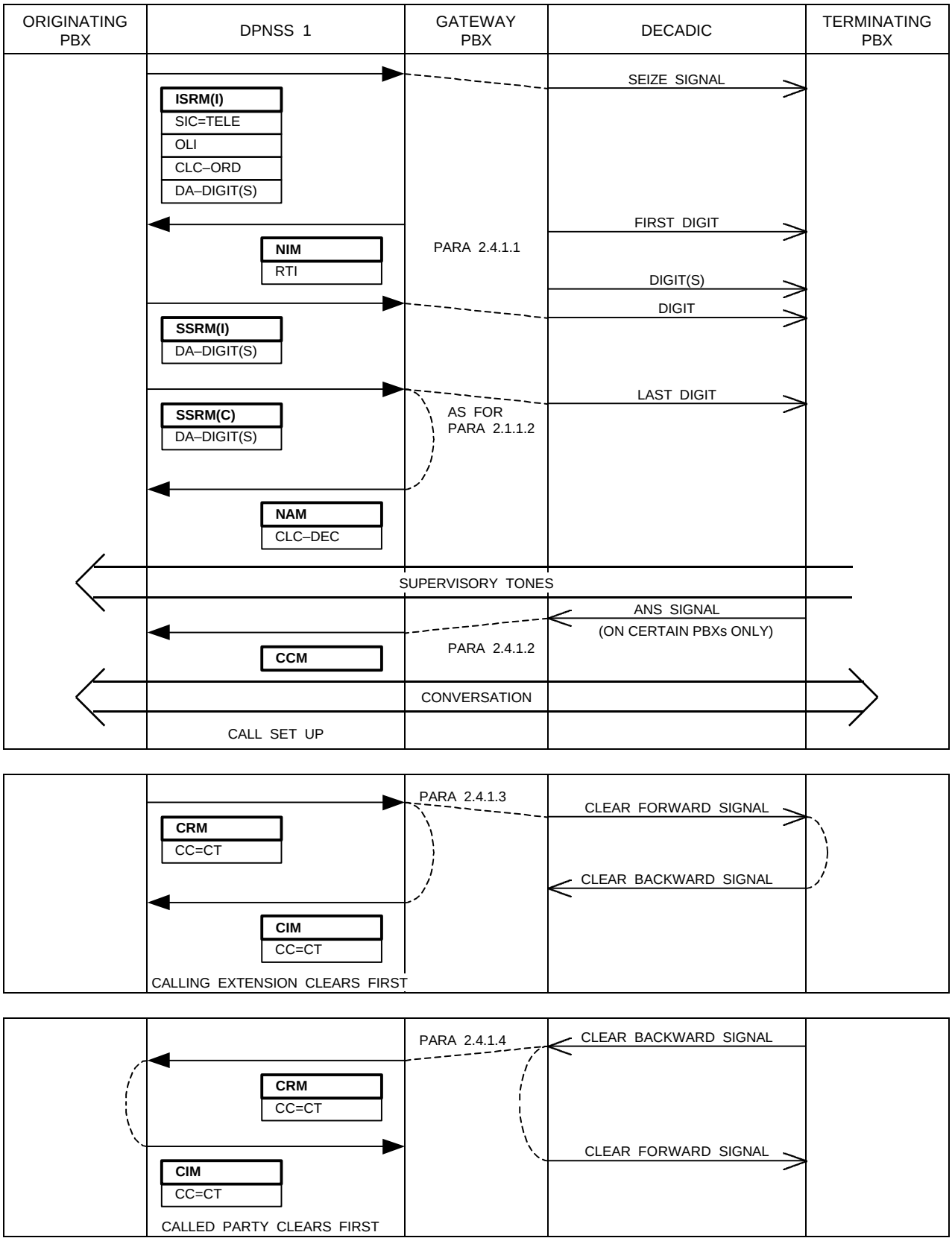
OUTLINE OF OPERATION

The signalling procedures are divided into two parts:

2.4.1 A Simple Call from a DPNSS 1 extension to a Decadic Private Circuit.

2.4.2 A Simple Call from a Decadic Private Circuit to a DPNSS 1 extension.

2.4.1 SIMPLE CALL FROM A DPNSS 1 EXTENSION TO A DECADIC PRIVATE CIRCUIT



2.4.1.1 When the Destination Address within an ISRM(C) or ISRM(I) plus one or more SSRMs identifies an outgoing Decadic route, the Gateway PBX selects a free circuit and sends a Seizing Signal to the next PBX.

After allowing a suitable pre-sending pause, the Gateway PBX sends the Destination Address via the Decadic circuit digit by digit in accordance with the appropriate signalling specification.

A NIM, containing RTI indicating Decadic encountered, should be sent as soon as possible to indicate that the call is being made to a Decadic route.

If the Decadic route is an alternative route the RTI string should also indicate the Alternative Route.

The transmission path should be connected through as soon as possible thus enabling the caller to hear any supervisory tones returned from the Decadic part of the Private Network.

In the event of all circuits on the required route from the Gateway PBX being busy the call will be cleared by sending a CRM containing the Clearing Cause: CON and a CIM should be expected in response.

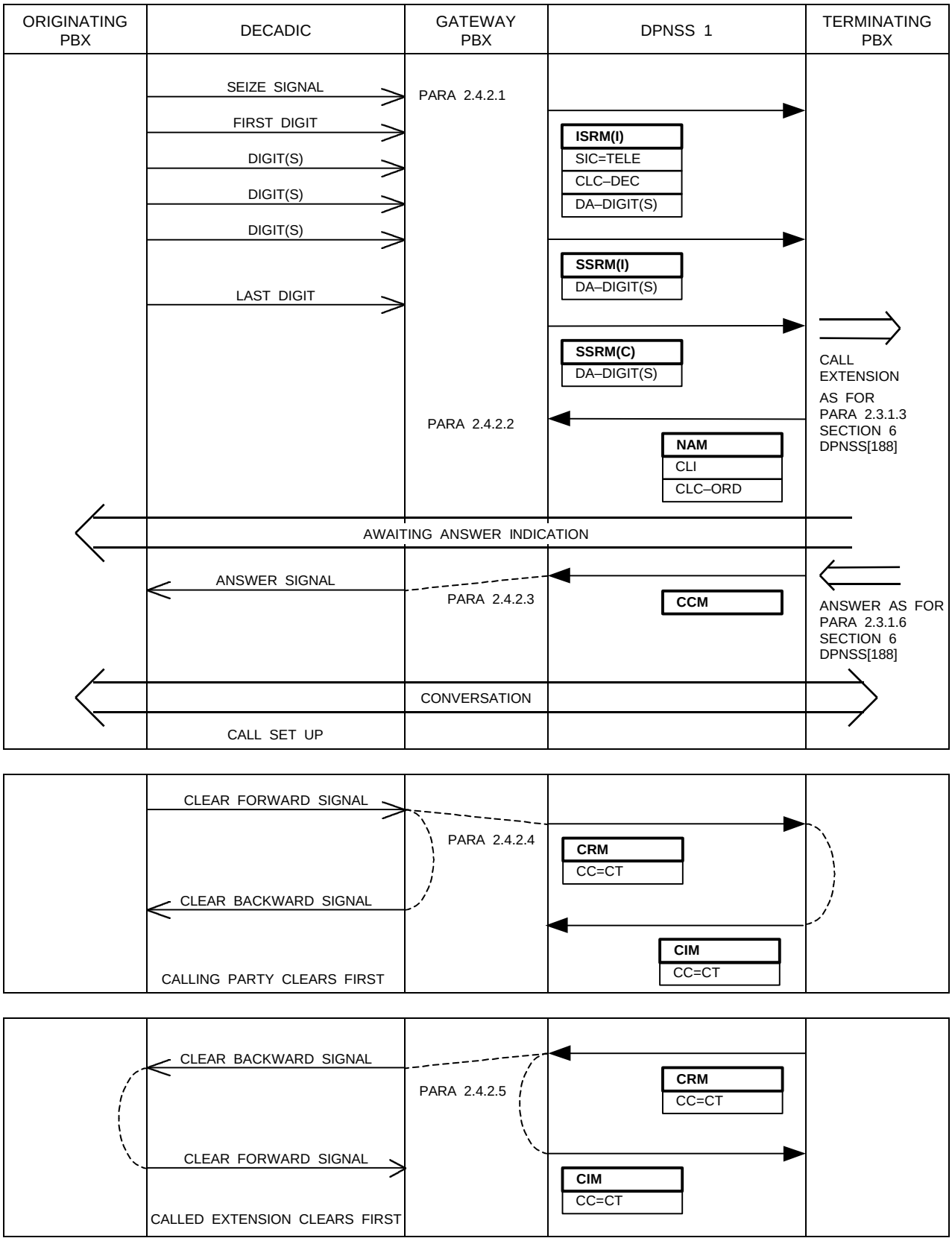
2.4.1.2 When an Answer signal is received from the Decadic network a CCM shall be sent on the DPNSS 1 signalling channel.

Where no Answer signal is available a CCM containing SIM-A will be sent after sending the NAM (eg 60 seconds after sending the NAM).

2.4.1.3 On receipt of a CRM the switch path should be released, a CIM returned and a Clear Forward Signal applied to the outgoing Decadic line. The clearing sequence on the Decadic line shall be in accordance with the appropriate signalling specification.

2.4.1.4 On receipt of a Clear Backward signal the Gateway PBX shall release the switched path and send a CRM Containing Clearing Cause: CT in the signalling channel. A CIM should be expected in response.

2.4.2 SIMPLE CALL FROM A DECADIC PRIVATE CIRCUIT TO A DPNSS 1 EXTENSION



2.4.2.1 When an incoming Decadic call arrives and digit analysis indicates a DPNSS 1 route within a Private Network, a transmission channel is reserved and an ISRM is sent on the signalling channel.

The ISRM contains the Service Indicator Code=TELE, Calling Line Category-DEC, Destination Address and optionally the Trunk Identity (TID) indicating the trunk number.

NOTE: PBXs manufactured to earlier issues of this specification may use the OLI string to indicate the Trunk Number.

Whenever possible an ISRM(C) should be used. However where the possibility of interworking with a slower speed signalling system exists, or the Gateway does not know the number length (either of which could result in excessive post dialling delays) an ISRM(I) may be used together with one or more SSRMs to send the Destination Address digits. If the End-of-Selection is recognised by the Gateway PBX (eg register timeout) before a NAM is received, then an SSRM(C) is used to indicate the end of selection information.

In order that any supervisory indications or verbal announcements may be heard by the caller the transmission path should be switched through as soon as possible.

2.4.2.2 Receipt of a NAM containing no Supplementary Information other than CLC and CLI indicates a successful routing within the DPNSS 1 Network and that Supervisory tones are being returned in the traffic channel. No further SSRMs should be sent following receipt of the NAM.

In the case of call failure within the DPNSS 1 network a CRM with the appropriate Clearing Cause will be used to drop the call back to the Gateway PBX from which an appropriate call failure tone will be applied to the incoming Decadic line. When a CRM is received, a CIM will be sent in response.

2.4.2.3 On receipt of a CCM the Gateway PBX applies an Answer Signal to the incoming Decadic line.

2.4.2.4 On Receipt of a Clear Forward Signal, the Gateway PBX shall release the switched path, return a Clear Backward Signal and send a CRM in the signalling channel containing a Clearing Cause: CT. A CIM is expected in response.

2.4.2.5 On receipt of a CRM from the destination PBX the Gateway shall return a CIM and apply a Clear Backward Signal to the incoming Decadic line.

2.5 INTERWORKING WITH SSMF5

This Paragraph deals with a Simple Automatic Telephony Call between an extension within a DPNSS 1 Private Network and a telephony terminal within an SSMF5 Private Network, or a Telephony Call between two extensions within SSMF5 Private Networks via a DPNSS 1 Private Network.

OUTLINE OF OPERATION

The signalling procedures are divided into five parts:

2.5.1 A Simple Call from a DPNSS 1 extension to SSMF5 Basic

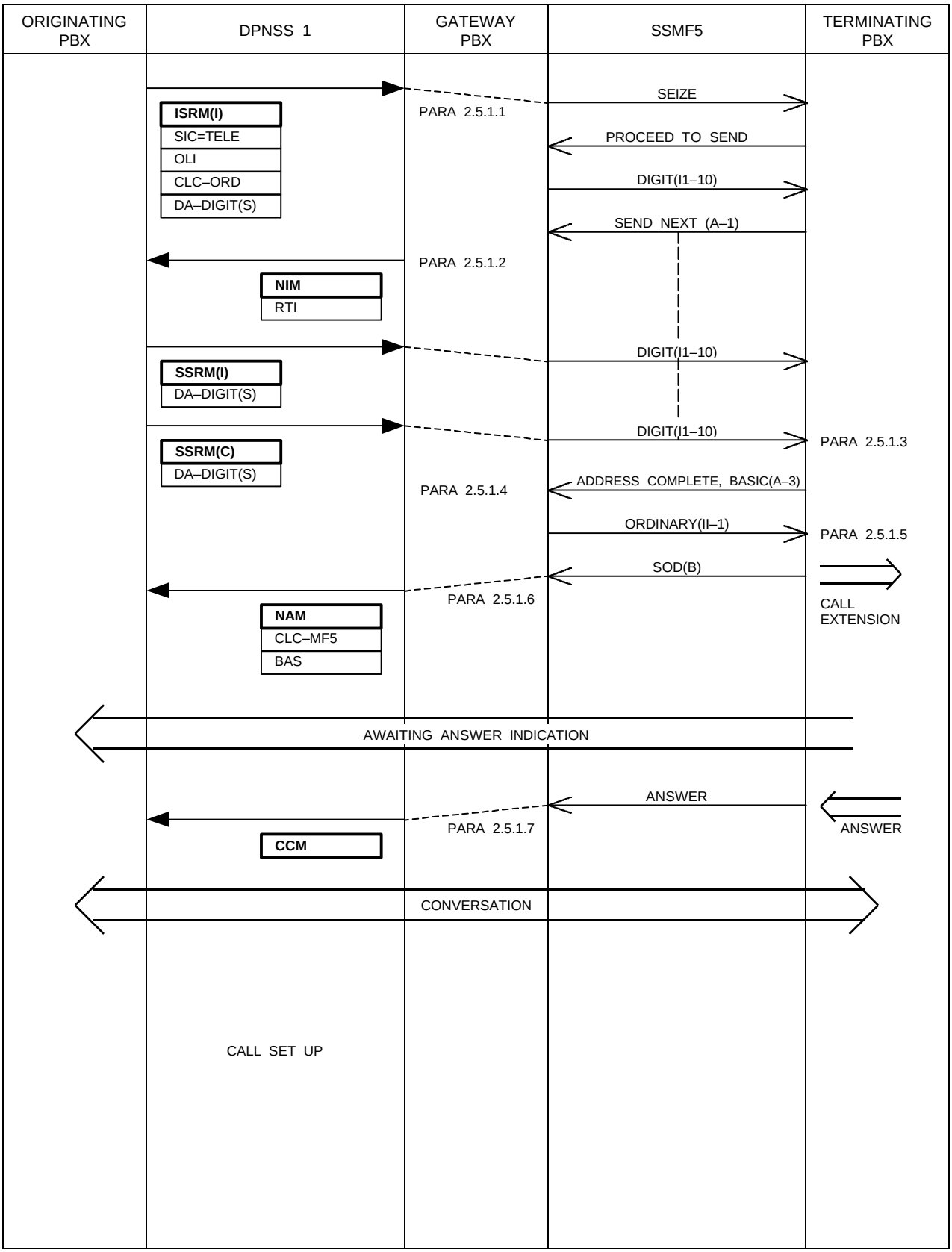
2.5.2 A Simple Call from SSMF5 Basic to a DPNSS 1 extension

2.5.3 A Simple Call from a DPNSS 1 extension to SSMF5 Enhanced

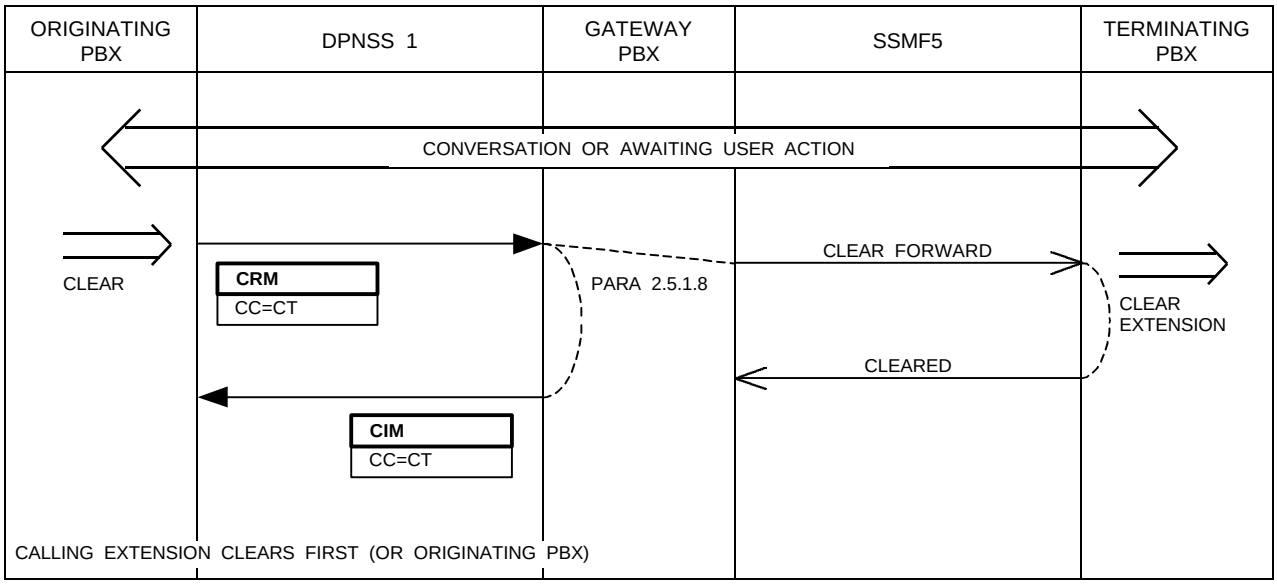
2.5.4 A Simple Call from SSMF5 Enhanced to a DPNSS 1 extension

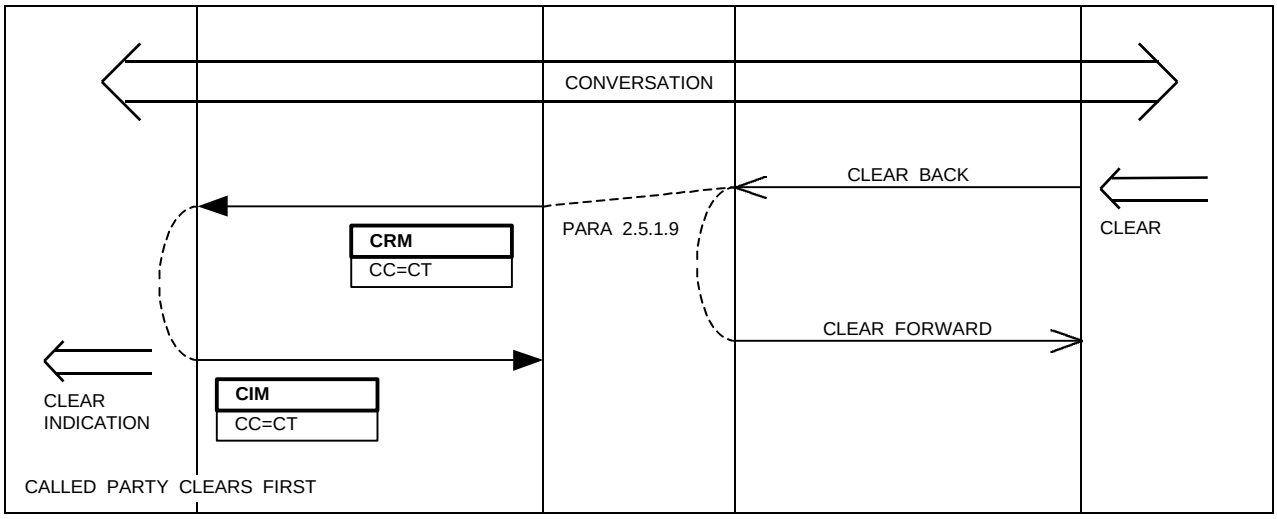
2.5.5 A Simple Call from SSMF5 via a DPNSS 1 network to SSMF5

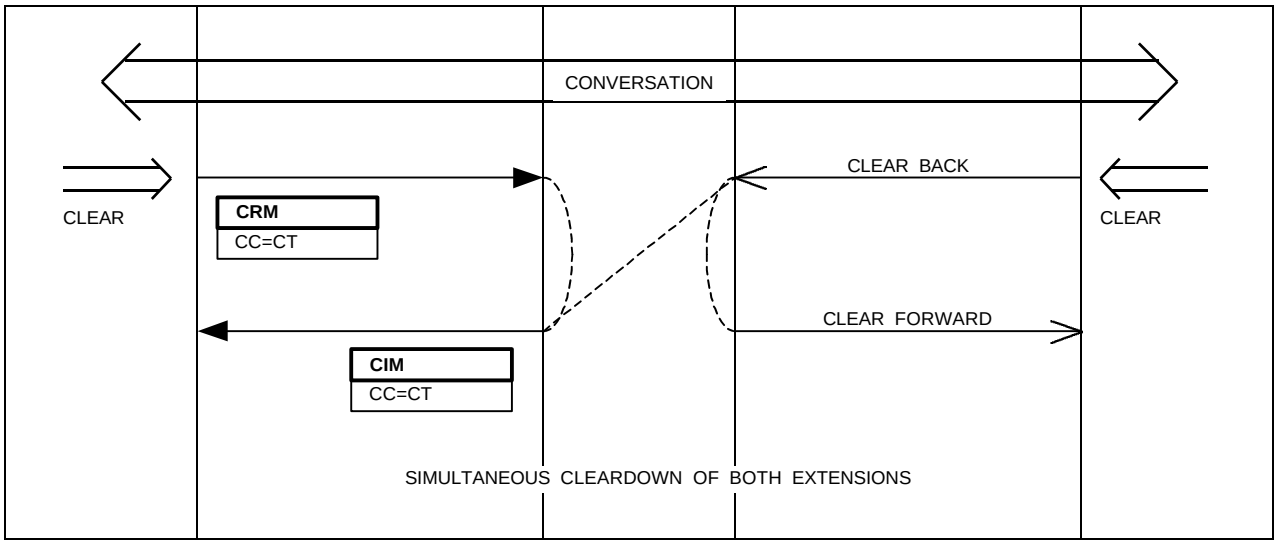
2.5.1 SIMPLE CALL FROM A DPNSS 1 EXTENSION TO SSMF5 BASIC



CLEARING SEQUENCE FROM DPNSS 1 TO SSMF5







2.5.1.1 When the Destination Address within an ISRM(C) or an ISRM(I) plus one or more SSRMs identifies an outgoing SSMF5 route, the Gateway PBX selects a free line and applies a seizing signal. On receipt of the Proceed to Send line signal the Gateway PBX sends the Destination Address as SSMF5 signals, and a NIM containing RTI indicating SSMF5 encountered, is returned to the Originating PBX.

In the event of all circuits on the required route from the Gateway PBX being busy, the call will be cleared by sending a CRM containing the Clearing Cause: CON and a CIM will be expected in response.

2.5.1.2 The Gateway PBX establishes the call into the SSMF5 Network in accordance with appropriate specification.

If an SSMF5 signal A-13 is received (PSTN-Send Next Digit) the Gateway PBX responds with an SSMF5 digit and sends a NIM, containing RTI indicating PSTN encountered, to the Originating PBX.

If an SSMF5 signal A-14 is received (Tandem encountered-Send Next Digit) the Gateway responds with an SSMF5 digit. No message is sent on the DPNSS 1 side.

If the SSMF5 route indicates either Call Failure (Signal A-4) or Congestion (Signal A-9) the Gateway PBX shall clear the SSMF5 route and send a CRM containing the Clearing Cause: STU or CON to the Originating PBX and expect a CIM in response.

2.5.1.3 When the address digits identify a user extension and the Terminating PBX is Basic SSMF5 it returns an SSMF5 Signal Address Complete - Basic (A-3).

2.5.1.4 On receipt of the SSMF5 Address Complete signal the Gateway PBX sends the SSMF5 equivalent of the CLC of the calling party as indicated previously in the ISRM.

Interworking with SSMF5 User Codes is not defined in this specification thus a request (SSMF5 signal A-7) will normally be rejected by sending the SSMF5 signal II-12 and awaiting an SSMF5 Address Complete signal.

NOTE: User Code is a Manufacturer specific subset of SSMF5 signalling, and agreement to interwork with DPNSS 1 will be on an individual Private Network basis only.

If the call has encountered a non SSMF5 route (SSMF5 Signal A-6) the DPNSS 1/SSMF5 Gateway PBX clears the SSMF5 registers and sends a NAM to the Originating PBX containing the CLC-PSTN or CLC-DEC as appropriate.

2.5.1.5 The Terminating PBX sends the State of Destination of the called party as an SSMF5 Group B Signal. Basic SSMF5 provides 10 State of Destination signals.

If the called party is free Call Arrival Indication (eg Ringing) is applied to it.

2.5.1.6 On receipt of the SSMF5 Group B SOD signal the Gateway PBX will send either:

i. A NAM containing the CLC-MF5 and string BAS, indicating that the call is via a Basic SSMF5 route implying that the called party is free. Optionally a TID String may also be included in the NAM. The intrudability status will be stored at the Gateway PBX.

NOTE: PBXs manufactured to earlier issues of this specification may use the CLI string to indicate the Trunk Number.

In this case the transmission path is switched through and the SSMF5 register released.

or ii. A CRM indicating that the call is either busy or has failed with the SSMF5 signals mapped to DPNSS 1 Clearing Causes as follows:

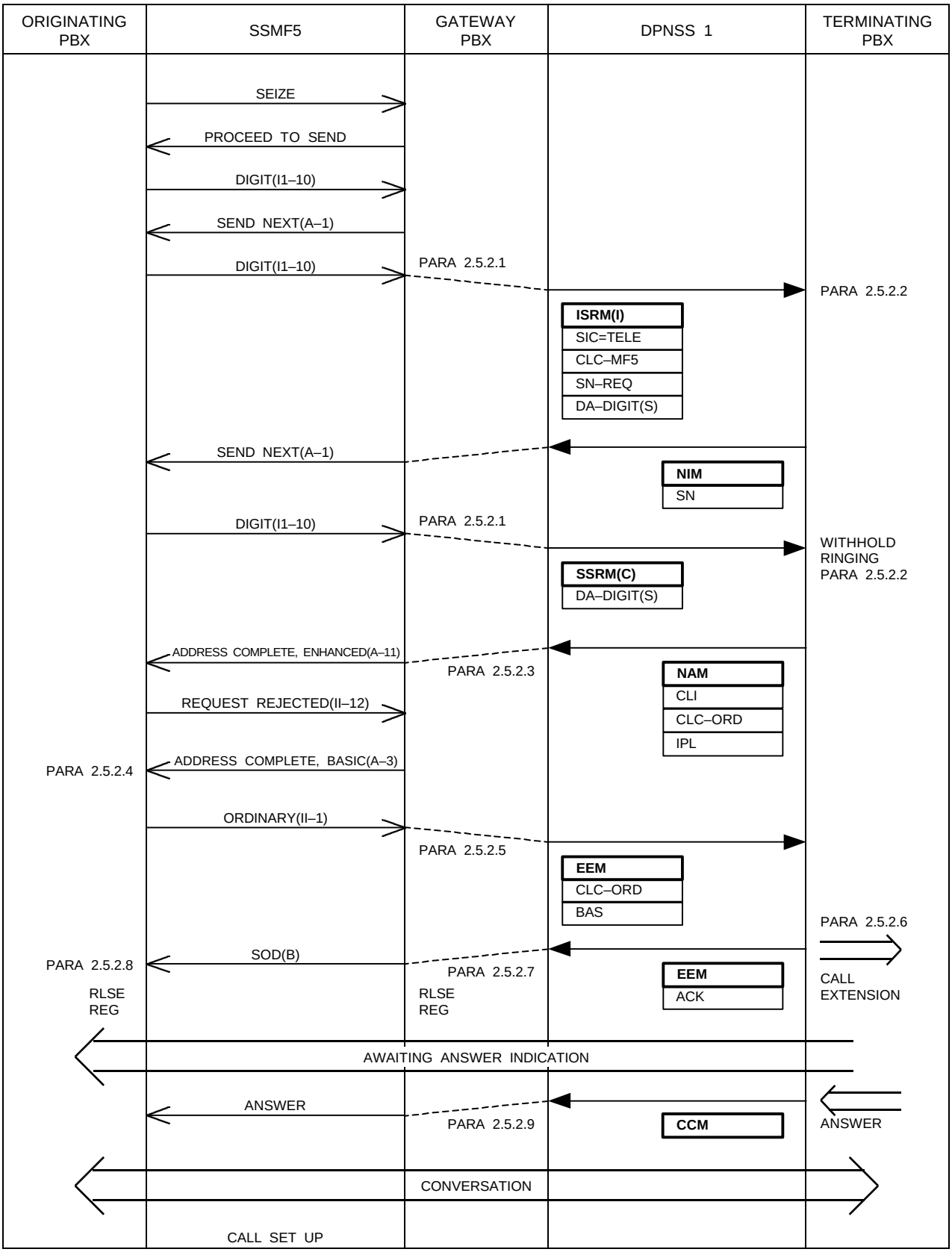
SSMF5	**DPNSS 1**
Parked	SOS
Call failed, PSTN barred	AB
Busy, intrudable	BY
Terminal PABX call failure	STU
Unallocated number, TOS	SOS
Call failed, incoming call barred	ICB
Terminal PBX congestion	CON
Busy, non intrudable	BY

2.5.1.7 On receipt of the line signal Answer, the Gateway PBX sends a CCM to the Originating PBX.

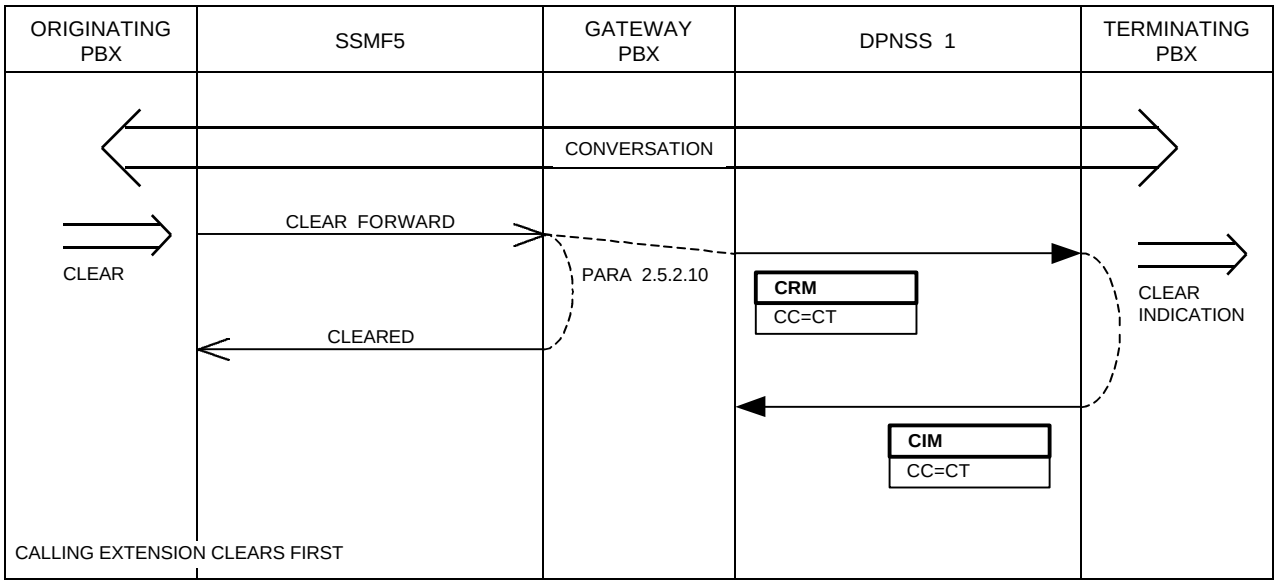
2.5.1.8 On receipt of a CRM the switch path should be released, a CIM returned and a Clear Forward signal applied to the outgoing line. The clearing sequence on the SSMF5 line shall continue in the normal way.

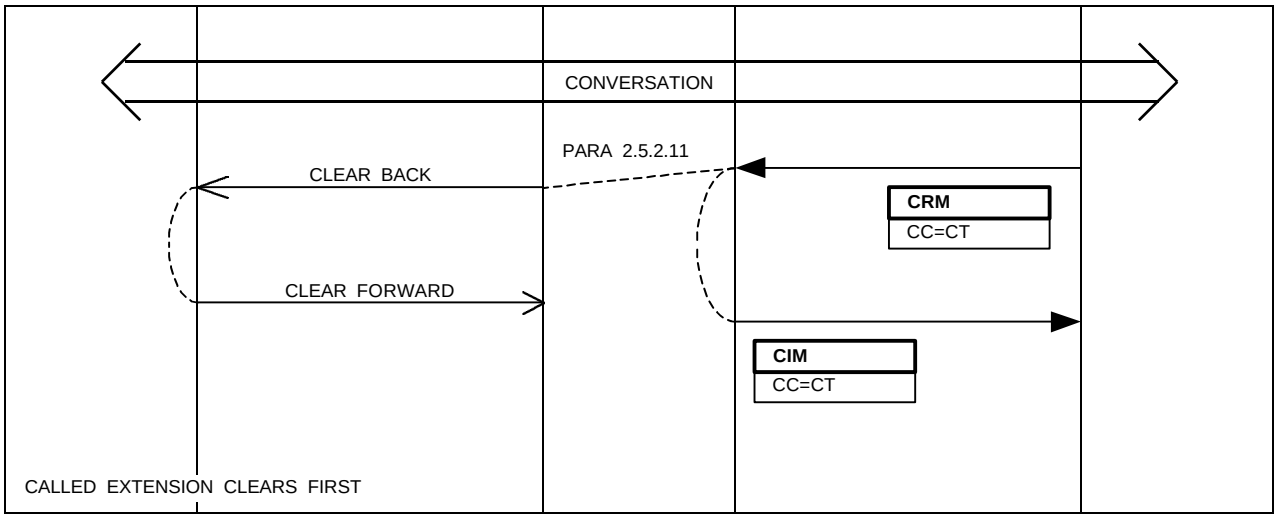
2.5.1.9 On receipt of a Clear Back line signal the Gateway PBX shall release the switched path and send a CRM Containing Clearing Cause: CT in the signalling channel and expect a CIM in response. The SSMF5 route shall be cleared down in the normal way.

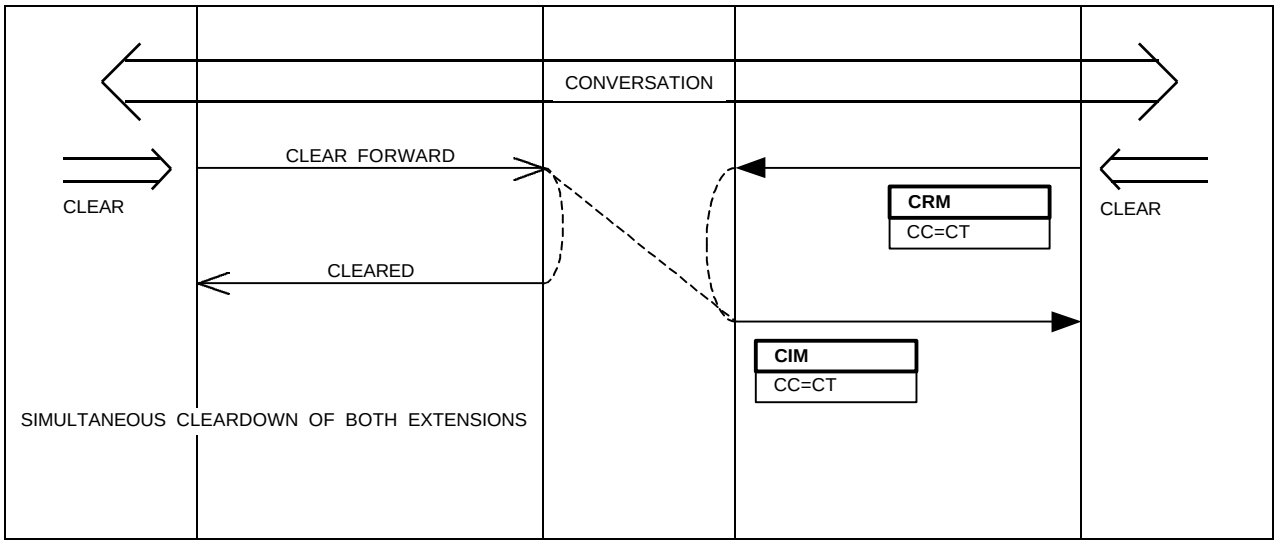
2.5.2 SIMPLE CALL FROM BASIC SSMF5 TO AN ORDINARY DPNSS 1 EXTENSION



CLEARING SEQUENCE FROM SSMF5 TO DPNSS 1







2.5.2.1 When an incoming SSMF5 call arrives and digit analysis indicates a DPNSS 1 route within the Private Network, a transmission channel is reserved and an ISRM is sent on the signalling channel.

The ISRM contains the Service Indicator Code (SIC), Calling Line Category (CLC)-MF5, the Send Next Request String (SN-REQ), Destination Address and optionally the Trunk Identity (TID) which indicates the trunk number.

NOTE: PBXs manufactured to earlier issues of this specification may use the OLI string to indicate the Trunk Number.

An ISRM is used, together with one or more SSRMs to send the remaining Destination Address digits. Once the ISRM has been sent further address digits are sent one by one in SSRMs only when requested by NIMs containing the Send Next (SN) Supplementary Information String. These NIMs are sent by each Transit PBX as the call progresses through the DPNSS 1 networks.

Following the ISRM(I) no SSRM may be sent until a NIM containing SN has been received unless there was no address information in the ISRM, in which case an SSRM with address information must be sent before any NIMs can be expected.

Each NIM is mapped to an SSMF5 Group A signal (eg A-1). Thus (after sending the ISRM) the Gateway PBX sends SSMF5 Group A signals only on receipt of NIMS. If the Gateway PBX wishes to inform the Originating PBX that a Transit PBX has been encountered, it may do so by sending the appropriate SSMF5 Group A signal (eg A-2, A-14).

The presence of CLC-MF5 and SN-REQ in the ISRM indicates to the DPNSS 1 PBXs that the call is from an SSMF5 route. It implies that the Intrusion Protection Level of the called party is being requested, and that NIMs containing SN must be used.

2.5.2.2 On receipt of the ISRM and providing sufficient information is available, the PBX determines whether the call is to an extension "On PBX" or to another PBX.

If more digits are required the PBX sends a NIM containing SN requesting the next digit.

When the address digits identify a user extension, and that extension is free, the Terminating PBX returns a NAM containing the CLI, CLC-ORD and the Intrusion Protection Level (IPL) of the called party.

NOTE: If the called extension is 'Barred PSTN calls' the CLC-ORD in the NAM shall contain this information as its Parameter.

Unlike ordinary DPNSS 1 calls the called party is not rung at this time but is guarded against further incoming calls, and barred outgoing calls. If the called party is busy the Terminating PBX sends a CRM containing the Clearing Cause: BY and the Intrusion Protection Level (IPL) of the established call. CRMs with other Clearing Causes will not contain an IPL.

If the address digits identify a route to another signalling system a NIM containing RTI is sent to give an early indication which system has been encountered (eg PSTN). The NIM requests further digits and implicitly eliminates the need to request information on a digit by digit basis.

If the route is SSMF5 see Paragraph 2.5.5.

2.5.2.3 On receipt of a NAM the Gateway PBX will normally request Enhanced SSMF5 working by sending an SSMF5 signal A-11. However if it knows the calling PBX is Basic SSMF5 only,(eg by path of entry) it may automatically send an SSMF5 A-3 signal. The IPL contained in the NAM is stored at the Gateway PBX.

If the Gateway PBX receives a NIM containing RTI which indicates an encounter with another signalling system (eg PSTN) the Gateway PBX sends this information as an SSMF5 signal (eg signal A-13 for PSTN or ISDN) and the SSMF5 Selection phase continues.

Further digits can be requested from the SSMF5 route without the need for NIMs containing SN. These digits are passed on to the DPNSS 1 path in SSRMs.

To enable the Gateway PBX to determine the End of Dialling, when each Group 'A' SSMF5 signal is sent, a time-out is started such that on expiry a Gateway generated Answer line signal or pulsed SSMF5 A-6 signal may be sent, and an SSRM(C) sent on the DPNSS 1 route indicating that routing information is complete.

If a NAM is received before timeout expiry the pulsed SSMF5 A-6 signal or Answer line signal shall be sent immediately and an SSRM(C) should not be sent.

Supervisory signals may then be carried across the switched transmission path.

If a CRM with one of the following Clearing Causes is received, the SSMF5 signalling sequence is completed with the Clearing Cause mapped to a Group B SSMF5 signal, and a CIM is sent in response.

The following Clearing Causes are mapped to SSMF5 Group B signals:

DPNSS 1	SSMF5
NU	Unallocated Number, TOS
AI	Unallocated Number, TOS
NT	Terminal PABX Call Failure
SU	Terminal PABX Call Failure
SI	Call Failed, Incoming Call Barred
SNU	Terminal PABX Call Failure
MNU	Terminal PABX Call Failure
STU	Terminal PABX Call Failure
BY	Busy Intrudable/Non Intrudable
CON	Terminal PABX Congestion
SOS	Unallocated Number, TOS
ICB	Call Failed, Incoming Call Barred
INC	Call Failed, Incoming Call Barred
FNR	Call Failed, Incoming Call Barred
AB	Call Failed, Incoming Call Barred
CT	Busy Intrudable/Unintrudable

2.5.2.4 If the Originating PBX provides SSMF5 Basic only and it receives an SSMF5 A-11 signal, it sends a Request rejected signal II-12 to the Gateway PBX, and expects an A-3 signal in response. On receipt of the A-3 signal the Originating PBX sends an SSMF5 Group II signal (eg signal II-1 [ORDINARY] from an Ordinary SSMF5 extension).

2.5.2.5 On receipt of the SSMF5 Group II signal, and providing a CRM was not previously received at Paragraph 2.5.2.3 the Gateway PBX sends an EEM containing the Calling Line Category (eg CLC-ORD) and the String BAS indicating that Basic MF5 working only is possible. The SSMF5 Group II signals are mapped to DPNSS 1 CLCs as follows:

SSMF5	DPNSS 1
Ordinary extension	ORD
Private circuit, restricted signalling	DEC
PSTN	PSTN

2.5.2.6 On receipt of the EEM the Terminating PBX sends an EEM containing ACK, and applies ringing to the called party. If the called party lifts the handset before receipt of the EEM, (eg to make an outgoing call) the request shall be blocked and an EEM containing ACK followed by a CCM sent when the EEM is received.

2.5.2.7 On receipt of an EEM containing ACK, the Gateway PBX sends an SSMF5 Group B signal SOD-Free to the Originating PBX, releases its SSMF5 register and switches through the transmission path.

2.5.2.8 An SSMF5 Group B signal SOD-FREE indicates that Awaiting Answer Indication is being applied to the calling party. If a call failure signal is received instead, the path is cleared in accordance with the appropriate line signalling system specification.

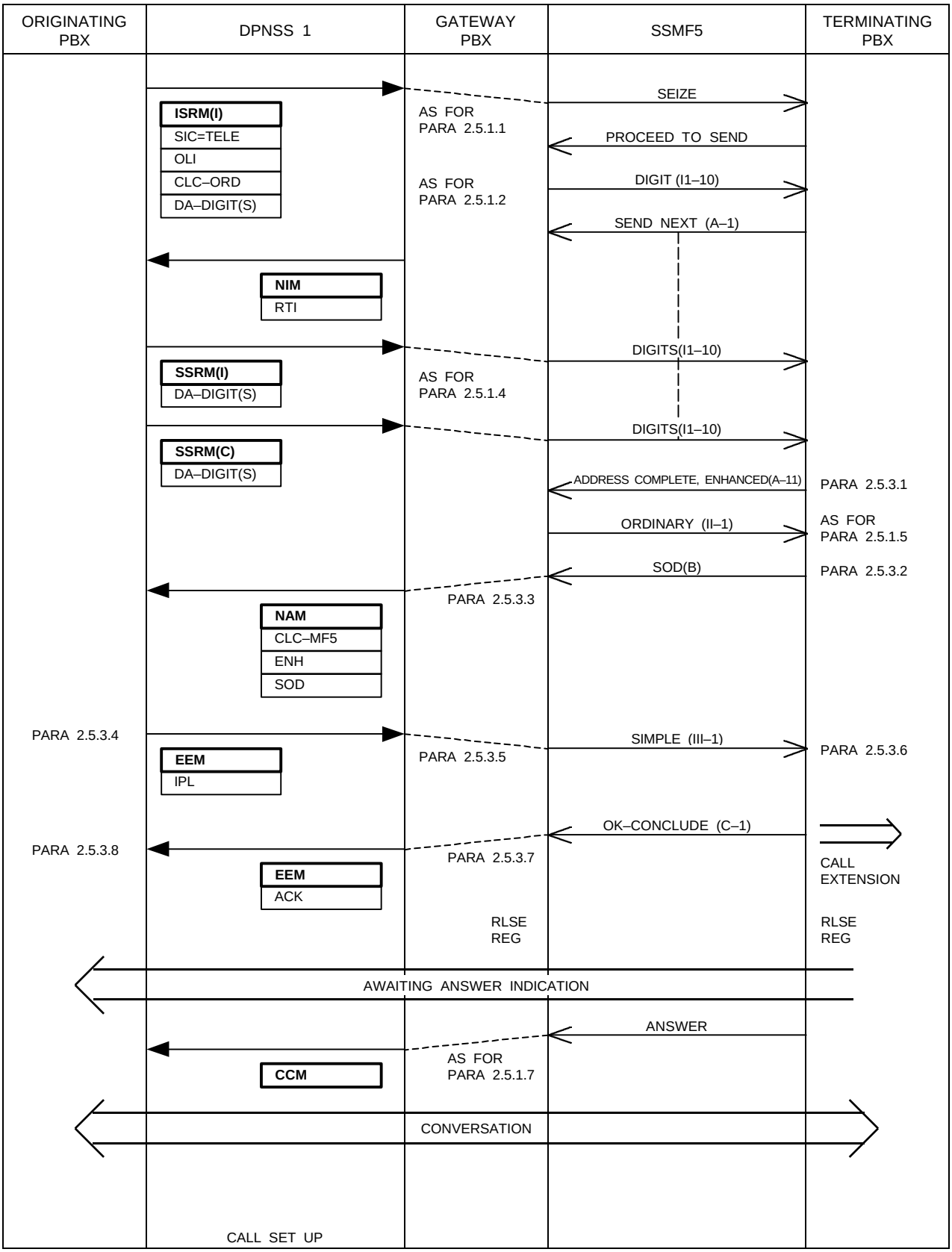
2.5.2.9 On receipt of the CCM the Gateway PBX sends an Answer line signal to the Originating PBX.

2.5.2.10 On receipt of a Clear Forward line signal the switch path should be released, a Cleared line signal returned and a CRM containing Clearing Cause: CT sent on the DPNSS 1 signalling channel. A CIM is expected in response.

If the cleardown is after an unsuccessful call attempt (eg busy) the DPNSS 1 path will already have been cleared.

2.5.2.11 On receipt of a CRM the switch path should be released, a CIM returned and a Clear Back line signal sent to the Originating PBX. The SSMF5 path should be cleared in accordance with the appropriate line signalling specification.

2.5.3 SIMPLE CALL FROM A DPNSS 1 EXTENSION TO SSMF5 ENHANCED



2.5.3.1 When the address digits identify a user extension and the Terminating PBX supports SSMF5 Enhanced it returns an Address Complete - Enhanced (A-11) signal.

2.5.3.2 The Terminating PBX sends the State of Destination of the called party, as an SSMF5 Group B signal. As Enhanced SSMF5 working is involved there are 14 possible Group B State-of-Destination (SOD) signals. The called party is not rung at this time.

2.5.3.3 On receipt of the SSMF5 Group B SOD signal the Gateway PBX will send either:

i. A NAM containing CLC-MF5,the string ENH (Indicating that the call is via an Enhanced SSMF5 route and implicitly requesting the Intrusion Protection Level (IPL) of the calling party), a State of Destination String (Coded as shown below) and optionally a Trunk Identity string (TID):

SSMF5	**DPNSS 1**
Free, Intrudable	SOD F (IPL=0)
Free, Non Intrudable	SOD F (IPL=3)
Free, Partially Intrudable	SOD F (IPL=1)
Busy, Intrudable	SOD B (IPL=0)
Busy, Non Intrudable	SOD B (IPL=3)
Busy, Partially Intrudable	SOD B (IPL=1)

The IPL is stored at the Gateway PBX.

NOTE: If the Gateway PBX does not support any of the Call Completion to Busy Subscribers services, a CRM containing the Clearing Cause: BY may be sent instead of the NAM.

Or ii. A CRM containing one of the Clearing Causes mapped as follows:

SSMF5	**DPNSS 1**
Parked	SOS
Call Failed, PSTN Barred	AB
Terminal PBX Failure	STU
Unallocated Number, TOS	SOS
Call failed Incoming Call Barred	ICB
Terminal PBX Congestion	CON

2.5.3.4 On receipt of a NAM containing ENH the Originating PBX sends an End to End message containing the Intrusion Protection Level of the calling party. If another signalling system is encountered within the SSMF5 network eg Decadic or PSTN, then this will be indicated by the appropriate CLC in the NAM. The NAM does not contain ENH in this case. DPNSS 1 signalling shall be the same as specified for the distant signalling system.

2.5.3.5 Dependent upon the IPL of the calling party the Gateway PBX sends an appropriate Group III SSMF5 signal. For the simple call this will be either:

DPNSS 1	**SSMF5**
IPL = 0	III-1 Simple Call
IPL = 3	III-3 Simple Call, non intrudable
IPL = 1	III-9 Simple Call, partially intrudable

2.5.3.6 On receipt of the SSMF5 Group III signal indicating a Simple Call, the Terminating PBX concludes SSMF5 signalling by sending the appropriate signal. This would be either:

i. C-1 Conclude SSMF5, no additional information

or ii. C-3 Conclude SSMF5, no additional information non-intrusion request rejected.

If the called party is free it has ringing applied to it.

2.5.3.7 On receipt of the SSMF5 Group C signal (C-1 or C-3) the Gateway PBX sends an EEM containing ACK which indicates that signalling has been completed and that the transmission path is switched through.

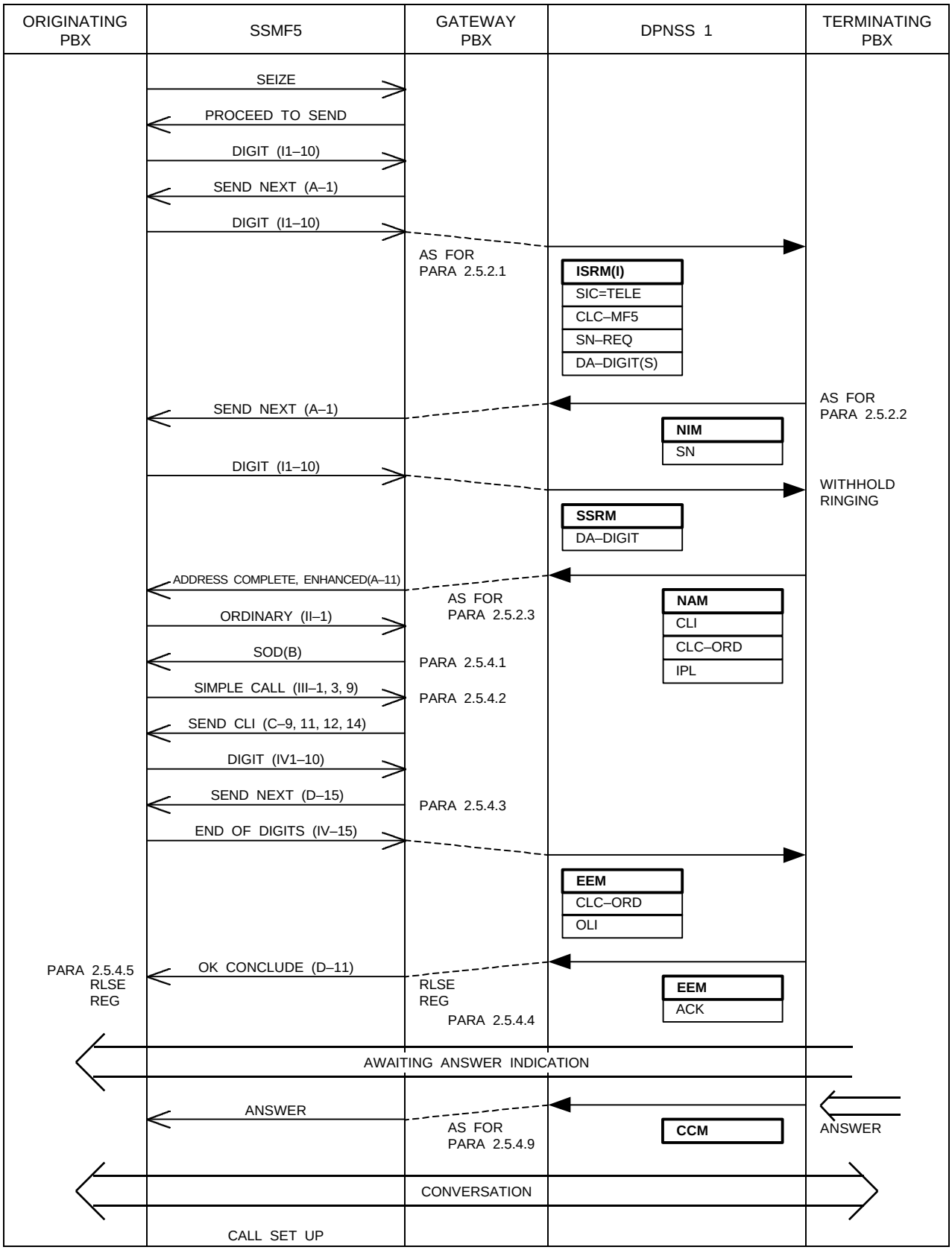
2.5.3.8 The action of the Originating PBX on receipt of the EEM containing ACK is dependent upon the SOD of the called party. If the called party is free receipt of the EEM containing ACK indicates that ringing is being applied to the called party.

If the call cannot be successfully completed (eg the called party is busy) the calling party has an appropriate indication applied to it and the Originating PBX awaits further action by the calling party (ie Supplementary Service request or Cleardown).

If the calling party clears then the call path is cleared.

If the calling party does not clear within a configurable timeout, then the PBX clears the call automatically, and applies a suitable indication to the calling party.

2.5.4 SIMPLE CALL FROM ENHANCED SSMF5 TO AN ORDINARY DPNSS 1 EXTENSION



2.5.4.1 When the Gateway PBX receives an SSMF5 Group II signal and SSMF5 Enhanced working is operative, it returns the appropriate SSMF5 group B SOD signal, based on the previously received NAM or CRM.

If a CRM had previously been received indicating call failure the SSMF5 Group B signal would indicate the reason for call failure mapped as for Paragraph 2.4.2.3 and await a response eg Clear forward or Supplementary Service Request.

2.5.4.2 On receipt of an SSMF5 Group III signal indicating a Simple Call the Gateway PBX sends an SSMF5 signal to request the CLI (signal C-9, C-11, C-12, or C-14) to the Originating PBX.

2.5.4.3 When all the SSMF5-CLI digits are known (ie receipt of the End of Digits signal) the Gateway PBX sends an EEM containing the information as an OLI and the CLC mapped to the previous SSMF5 Group II signal as follows:

SSMF5 CLC	**DPNSS 1 CLC**
Ordinary Extension	ORD
Private Circuit Restricted Signalling	DEC
PSTN	PSTN
Ordinary Holding PSTN	ORD (H PSTN as a Parameter)
Extraordinary Extension	ORD (EX as a Parameter)

Action on receipt of other SSMF5 Group III signals and Supplementary Service requests is covered in other Sections of this specification.

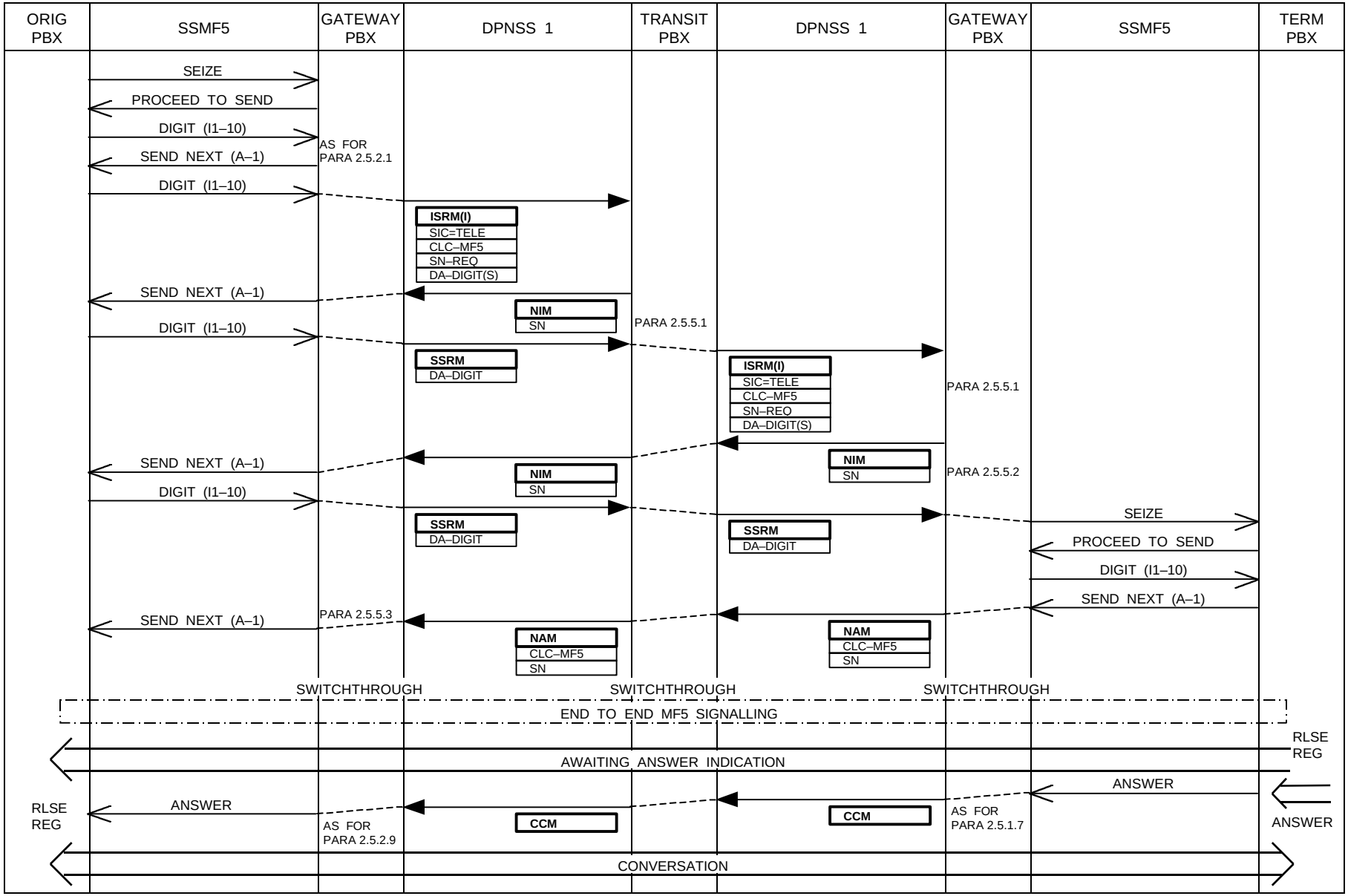
It should be noted that the OLI in the DPNSS 1 EEM will represent the Destination Address within the SSMF5 network. Unless the SSMF5 and DPNSS 1 parts of the network share a global numbering plan this CLI cannot be used, unchanged, as a Destination Address within the DPNSS 1 network.

2.5.4.4 On receipt of the EEM containing ACK the Gateway PBX sends an SSMF5 Conclude signal to the Originating PBX.

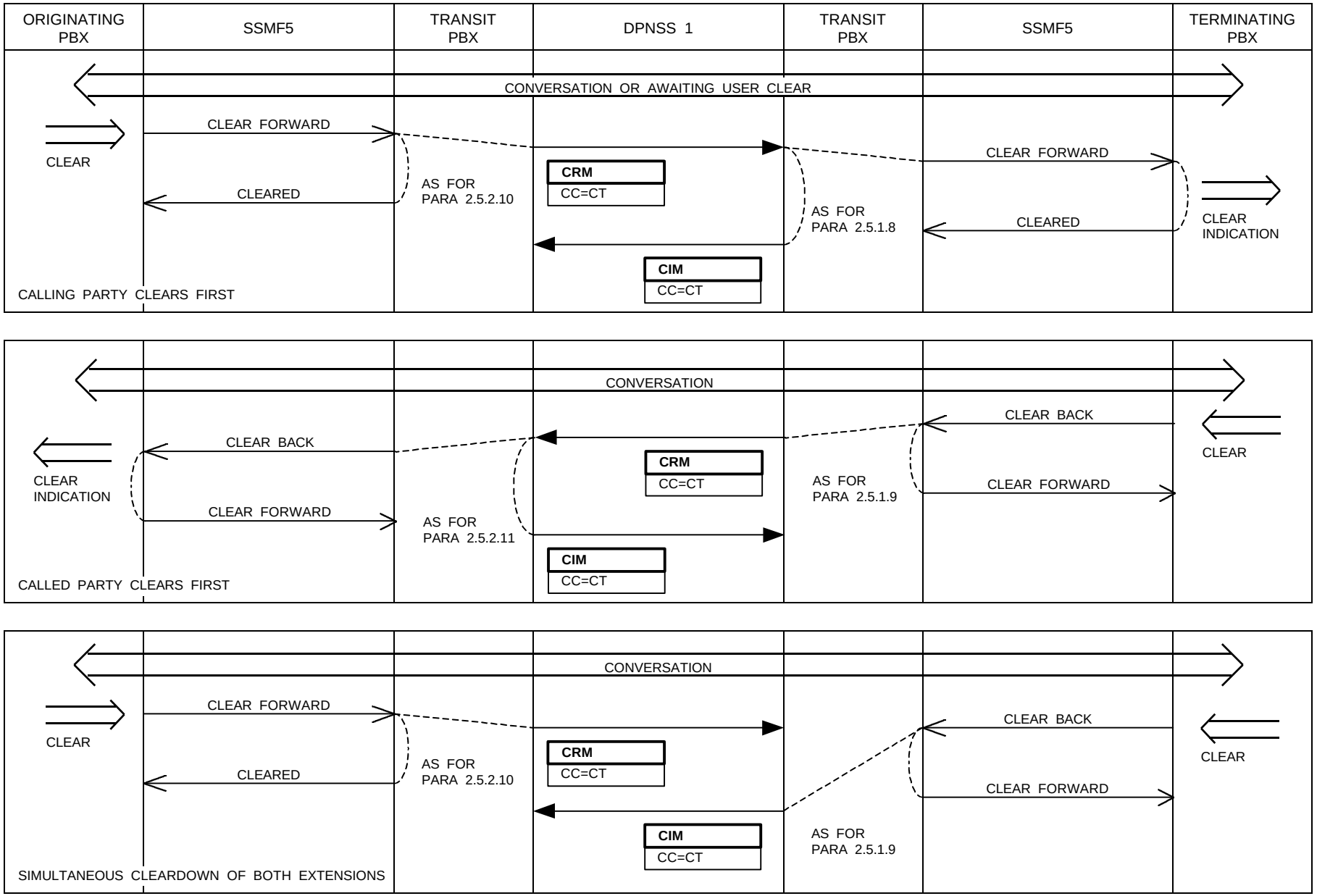
2.5.4.5 Receipt of the Conclude signal when the called party is free, indicates that Ringing is being applied to the calling party.

If a Call Failure signal is received, NU tone is applied to the calling party.

2.5.5 CALL FROM SSMF5 VIA DPNSS 1 TO SSMF5



CLEARDOWN OF A CALL FROM SSMF5 VIA DPNSS 1 TO SSMF5



2.5.5.1 If the digits in an ISRM are insufficient to determine an outgoing route, the PBX requests the next digit by returning a NIM containing SN.

2.5.5.2 When sufficient digits have been received to determine the route and it is outgoing to SSMF5, the Gateway PBX selects an outgoing line, applies a Seizing line signal and sends a NIM, containing RTI indicating SSMF5 encountered, to the Originating PBX. On receipt of the Proceed to Send line signal, the Gateway PBX sends the address digits it has already received from the Originating PBX. When all available digits have been sent the Gateway PBX sends a NAM containing the CLC-MF5 and an indication of the most significant SSMF5 Group A signal which has been received from the responding SSMF5 PBX.

The following SSMF5 Group A signals may be shown in the Indication field of the NAM as a Parameter of the CLC-MF5.

SSMF5	**DPNSS 1**
Send Next (A-1)	SN
PSTN encountered, Send Next (A-13)	A-13
Tandem encountered, Send Next (A-14)	A-14
Tandem Encountered, Send First (A-2)	A-2
Tandem Encountered, Alternatively Routed Call, Send First (A-8)	A-8
Send Calling Party Category (A-5)	A-5
Early Enhanced Code Available, No Information (A-12)	A-12
Early Enhanced Code Available, Information Ready (A-10)	A-10
Address Complete, Enhanced MF5 (A-11)	ENH
Address Complete, Basic MF5 (A-3)	BAS
Address Complete, Request User Code (A-7)	A-7

If the Gateway PBX receives either SSMF5 signal A-9 (Routing Congestion) or A-4 (Routing Call Failure) it clears the SSMF5 register and sends a CRM to the preceding PBX.

The Clearing Cause of the CRM will be mapped as follows to SSMF5 signals:

SSMF5	**DPNSS 1**
Routing Congestion	CON
Routing Call Failure	AI

When any SSMF5 signal other than one of the Send Next signals is received, sending of further SSMF5 signals ceases, and a NAM indicating the received signal is returned to the preceding PBX.

Following the sending of the NAM, and completion of the SSMF5 compelled cycle, the transmission path is switched through.

2.5.5.3 On receipt of a NAM the Gateway PBX sends the SSMF5 Group A signal identified, and on completion of the compelled SSMF5 cycle the Transmission path is switched through. SSMF5 is then signalled transparently within the traffic channel.

If a CRM is received the appropriate SSMF5 Group A signal is sent, the SSMF5 register released, and a CIM is sent in response to the CRM.

Further line signalling (eg Answer, Clear Forward, Clear Back etc.) shall be relayed across the DPNSS 1 link within the signalling channel as CCM CRM etc.

Where cleardown of the DPNSS 1 link is required this shall be in accordance with the normal signalling sequence.

3 SDL DIAGRAMS

INDEX

FIGURE 1. Simple Telephony Call From DPNSS 1 To The PSTN

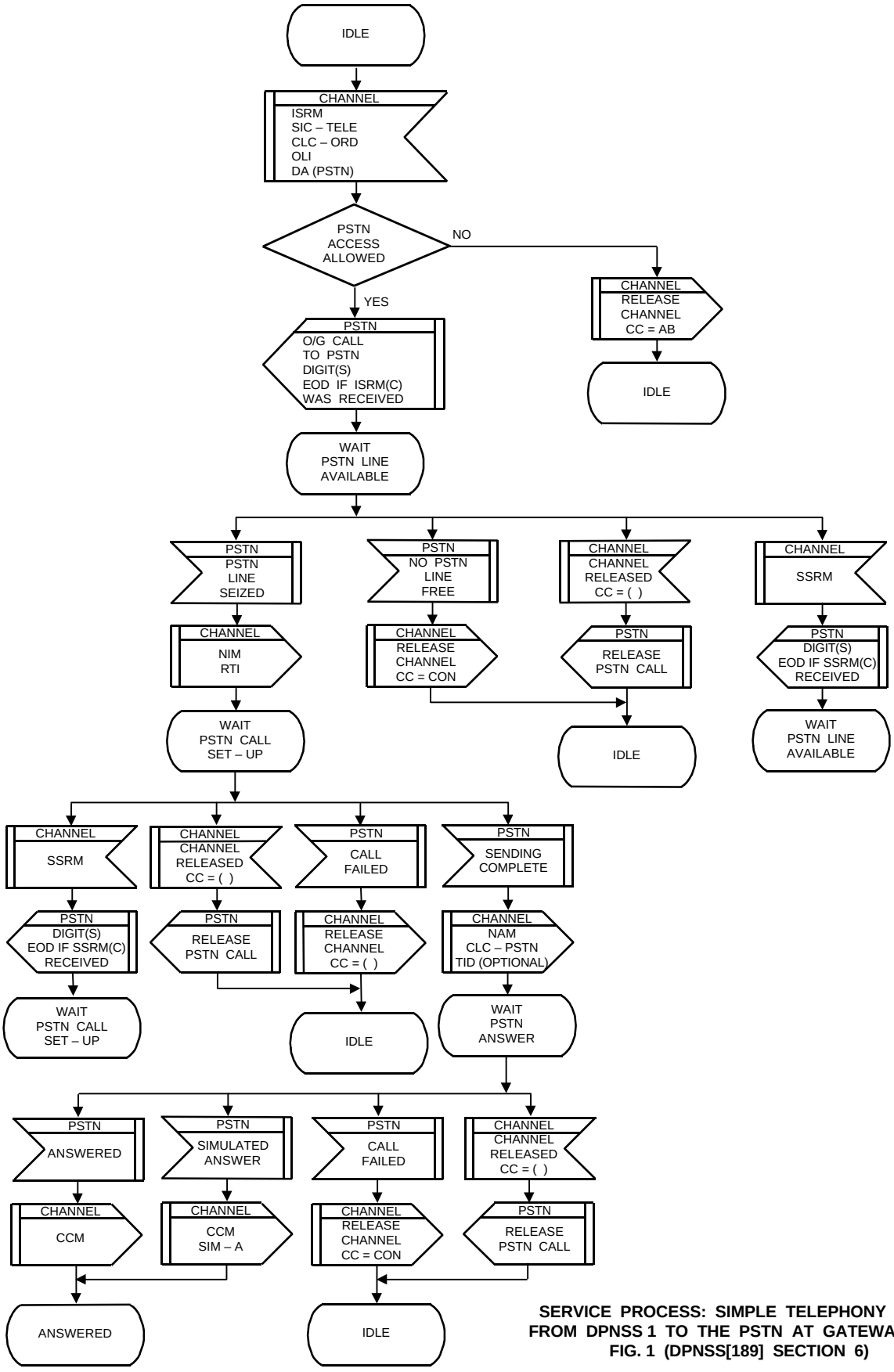
FIGURE 2. Simple Telephony Call From The PSTN To DPNSS 1

FIGURE 3. Simple Telephony Call From DPNSS 1 To DASS 2

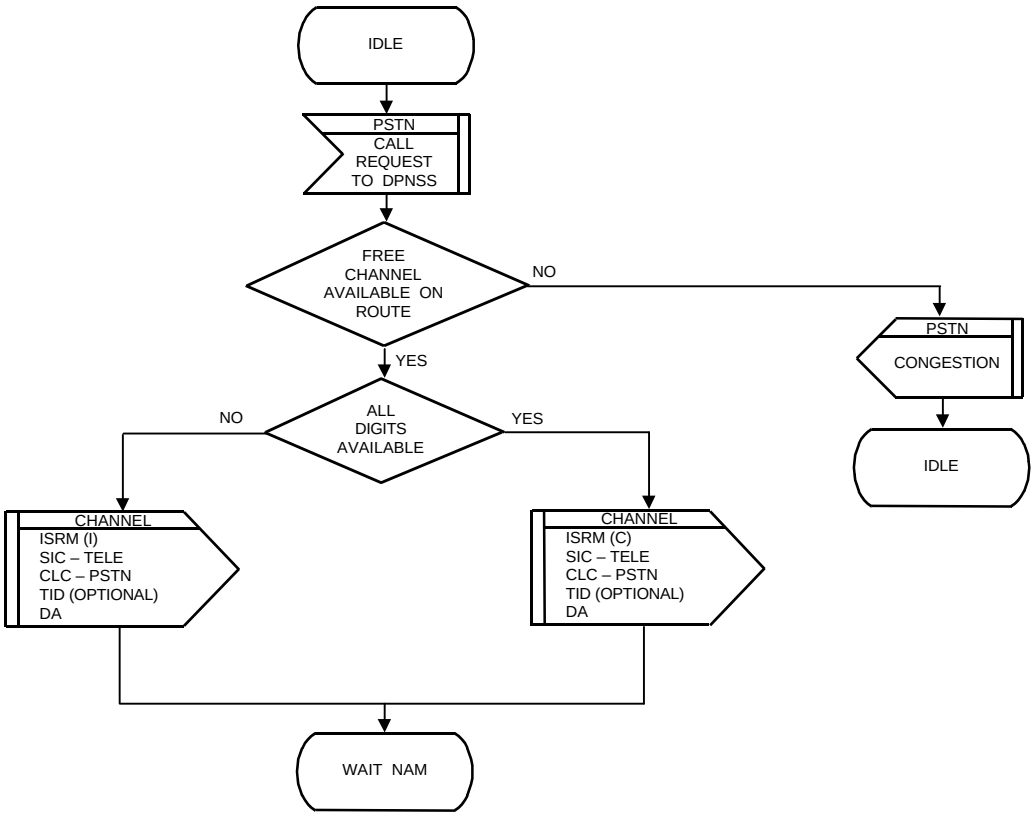
FIGURE 4. Simple Telephony Call From DASS 2 To DPNSS 1

FIGURE 5. Simple Telephony Call From DPNSS 1 To Decadic

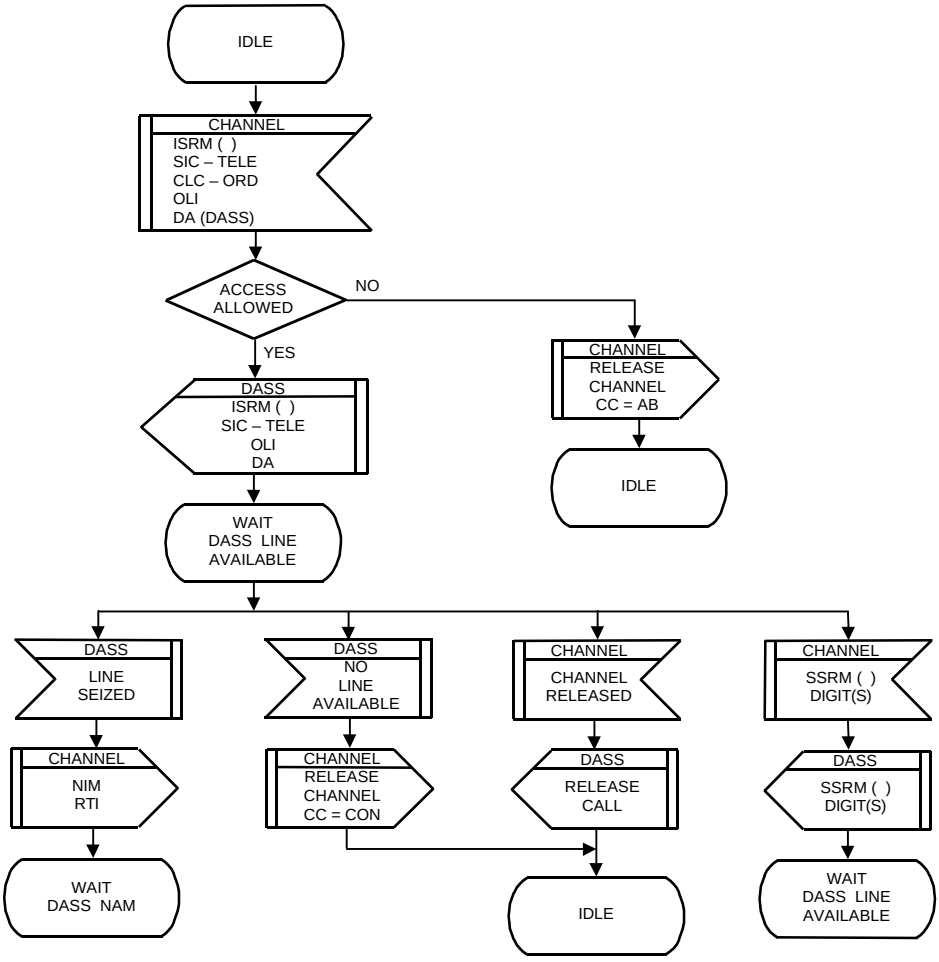
FIGURE 6. Simple Telephony Call From Decadic To DPNSS 1



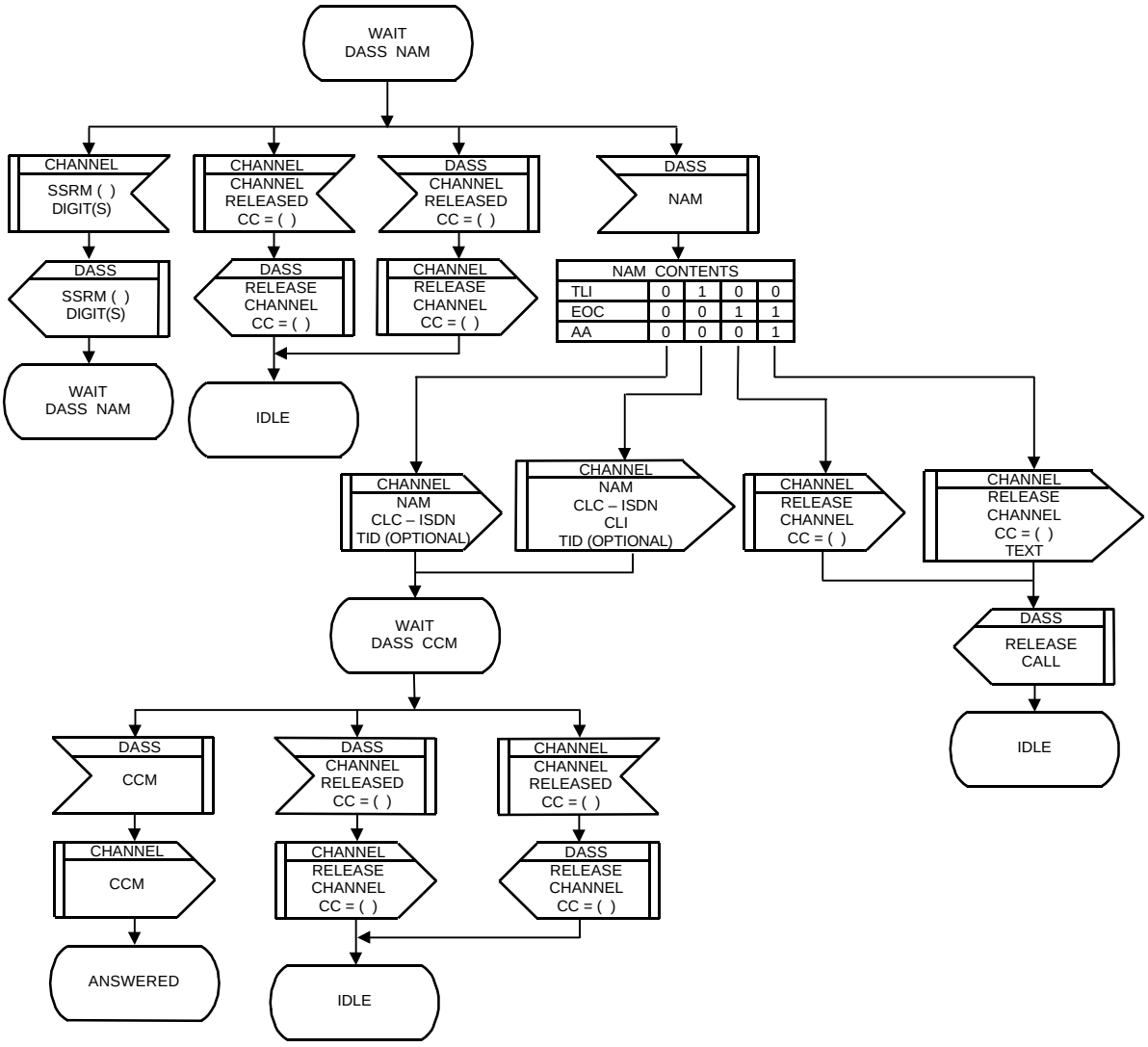
SERVICE PROCESS: SIMPLE TELEPHONY CALL FROM DPNSS 1 TO THE PSTN AT GATEWAY PBX FIG. 1 (DPNSS[189] SECTION 6)



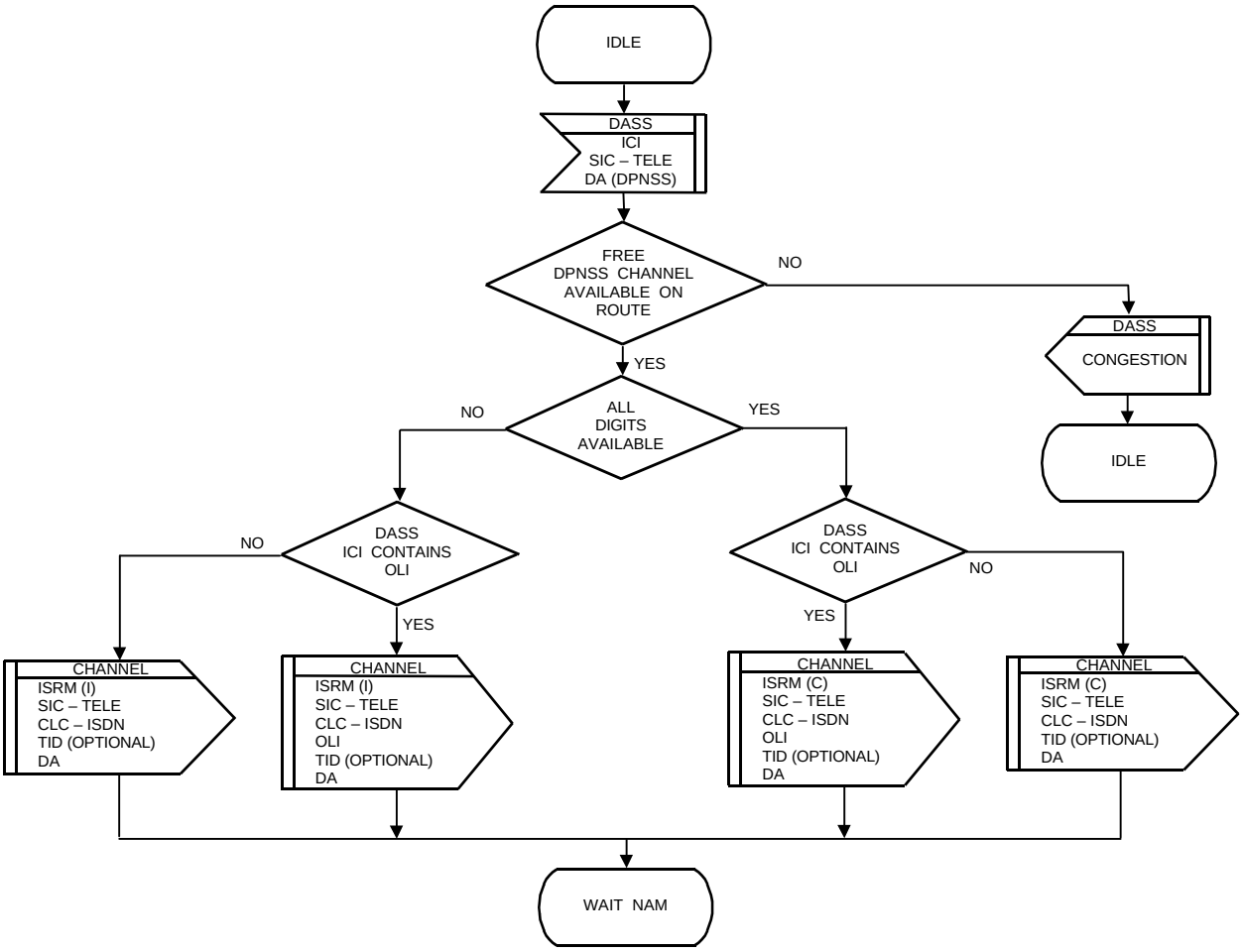
SERVICE PROCESS: SIMPLE TELEPHONY CALL FROM THE PSTN TO DPNSS 1 AT GATEWAY PBX
FIG. 2 (DPNSS[189] SECTION 6)



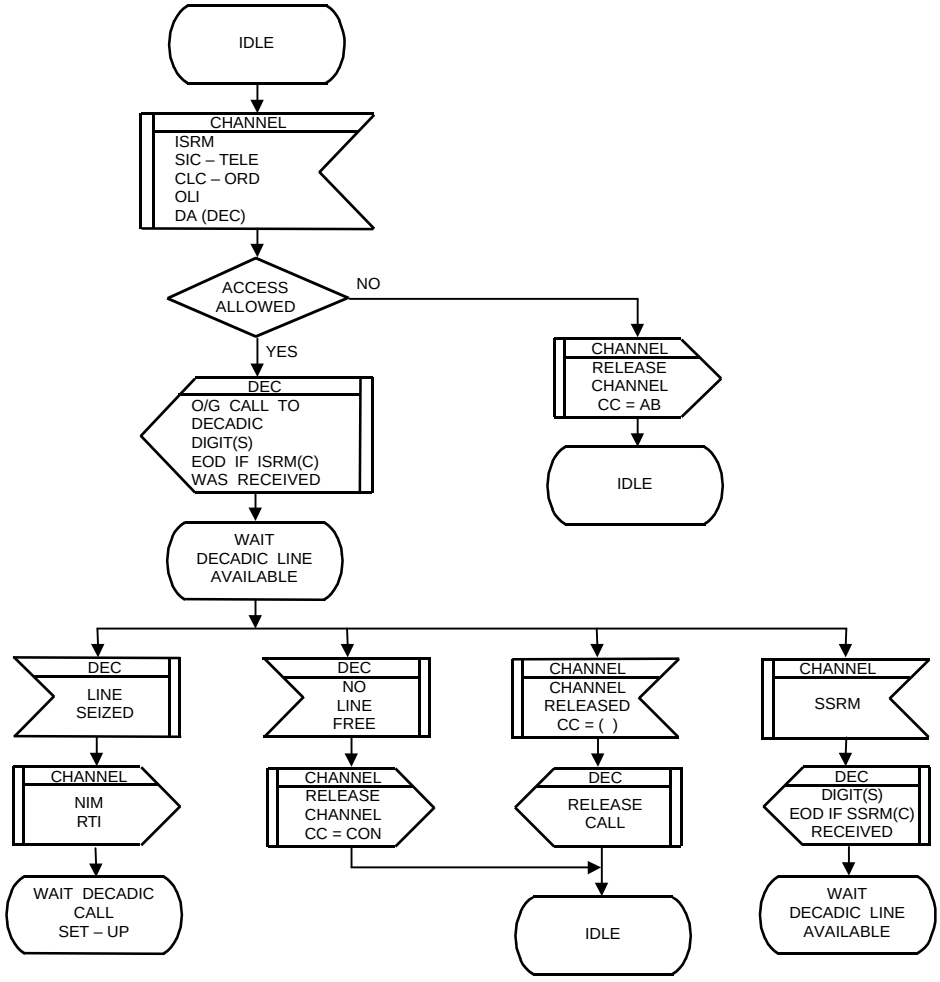
SERVICE PROCESS: SIMPLE TELEPHONY CALL
FROM DPNSS 1 TO DASS 2 AT GATEWAY PBX
FIG. 3 (DPNSS[189] SECTION 6)
SHEET 1 OF 2



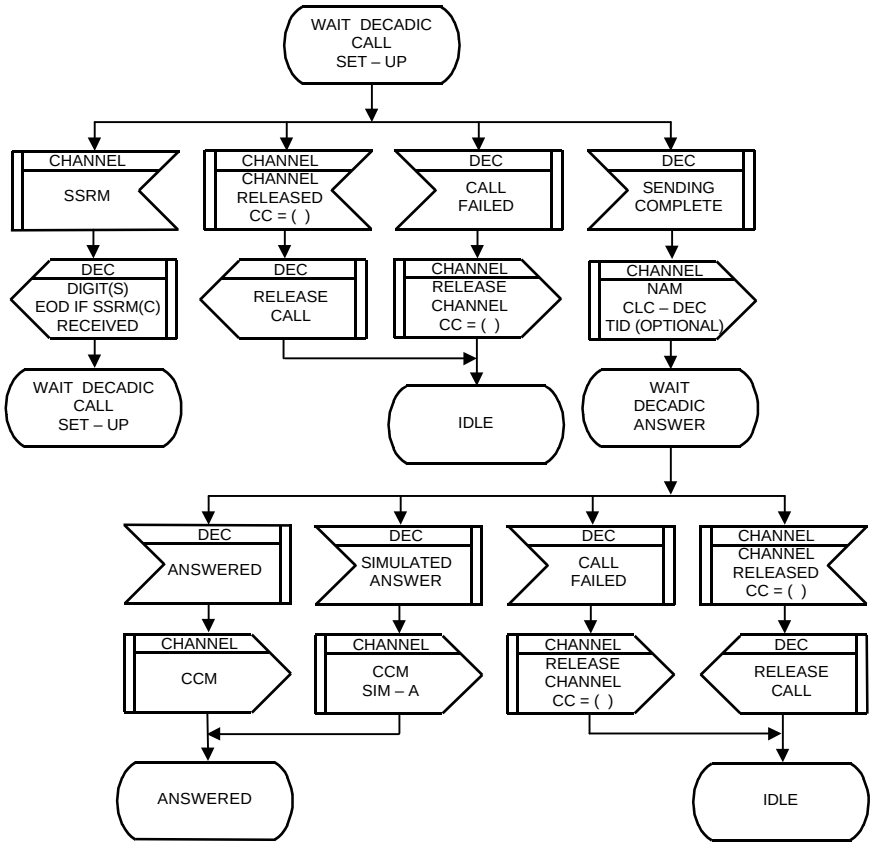
SERVICE PROCESS: SIMPLE TELEPHONY CALL
FROM DPNSS 1 TO DASS 2 AT GATEWAY PBX
FIG. 3 (DPNSS[189] SECTION 6)
SHEET 2 OF 2



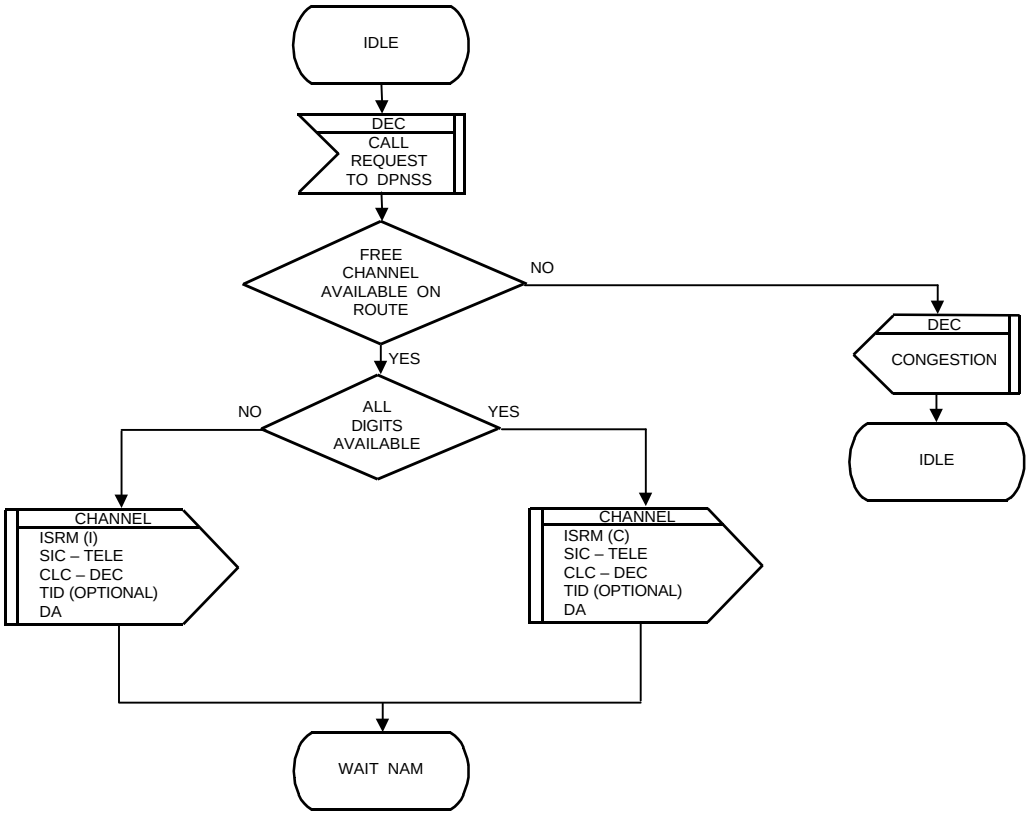
SERVICE PROCESS: SIMPLE TELEPHONY CALL
FROM DASS 2 TO DPNSS 1 AT GATEWAY PBX
FIG. 4 (DPNSS[189] SECTION 6)



SERVICE PROCESS: SIMPLE TELEPHONY CALL
FROM DPNSS 1 TO DECADIC AT GATEWAY PBX
FIG. 5 (DPNSS[189] SECTION 6)
SHEET 1 OF 2



SERVICE PROCESS: SIMPLE TELEPHONY CALL
FROM DPNSS 1 TO DECADIC AT GATEWAY PBX
FIG. 5 (DPNSS[189] SECTION 6)
SHEET 2 OF 2



SERVICE PROCESS: SIMPLE TELEPHONY CALL
FROM DECADIC TO DPNSS 1 AT GATEWAY PBX
FIG. 6 (DPNSS[189] SECTION 6)

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 7 - CIRCUIT SWITCHED DATA CALL

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2.5 SSMF5 .....Page 12

HISTORY

Issue 1 - May 1985
Issue 2 - March 1988

Issue 3 - December 2001 - Specification renamed as DPNSS[189]
- Unused references removed
- Reference to use of ISDN interworking strings added
- Recommendation for mapping DPNSS 1 SIC to DASS 2 SIC added

REFERENCES

DPNSS[188] Global Issue 7
BTNR 190 Issue 2

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for Circuit Switched Data Calls.

1.2 Subsection 2 details the Circuit Switched Data Call when DPNSS 1 interworks with other signalling systems. In general the description is given in the form of explanatory text but in the case of DASS 2 Message Sequence Diagrams (MSDs) are also included.

1.3 Alternative action (eg for unsuccessful calls) not shown in MSDs is included in the text. The text is referred to in MSDs at appropriate points in the sequence.

1.4 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

2.1.1 General

As the PSTN does not provide the Circuit Switched Data Call Service there is no special PSTN signalling involved.

However, if a PBX acting as a DPNSS 1 Gateway to the PSTN receives an ISRM containing SIC=DATA the request may be allowed under certain circumstances; see Paragraph 2.1.2.

Additionally, if an ISRM containing CLC-PSTN is received at a DPNSS 1 Terminating PBX and which is recognised as being destined for a data terminal, the request may be allowed under certain circumstances; see Paragraph 2.1.3.

2.1.2 Data Call from a DPNSS 1 Terminal to the PSTN

When an ISRM containing SIC=DATA is received at a Gateway PBX from a DPNSS 1 data terminal there are three cases to consider:

2.1.2.1 In the case where the DPNSS 1 traffic channel incoming to the Gateway is analogue the call shall be treated by the Gateway as a Simple Telephony Call interworking with the PSTN (see SECTION 6, Paragraph 2.1.1).

2.1.2.2 In the case where the DPNSS 1 traffic channel incoming to the Gateway is digital and where a modem is available at the Gateway to suit the DATA SIC the modem shall be inserted and the call treated as a Simple Telephony Call interworking with the PSTN (see SECTION 6, Paragraph 2.1.1).

2.1.2.3 In the case where the DPNSS 1 traffic channel incoming to the Gateway is digital and where a modem is not available at the Gateway to suit the DATA SIC , the call shall be rejected with a CRM containing the Clearing Cause: INC and optional Supplementary Information String CLC-PSTN.

A new call could automatically be made using a suitable modem provided at the Originating PBX. In this case the new call will be made as a telephony call (SIC=TELE).

2.1.3 Call from the PSTN to a DPNSS 1 Data Terminal

When an ISRM containing CLC-PSTN is received at a terminating PBX and which is recognised as a call destined for a DPNSS 1 Data Terminal there are two cases to be considered:

2.1.3.1 In the case where a suitable modem is available at the Terminating PBX the modem shall be inserted and the call treated as a Simple Telephony Call interworking with the PSTN (see SECTION 6, Paragraph 2.1.2).

2.1.3.2 If a suitable modem is not available at the Terminating PBX the call shall be rejected with a CRM containing the Clearing Cause: SI and Supplementary Information String SIC with a Parameter SIC corresponding to the characteristics of the wanted data terminal.

The SIC returned in the CRM may be used by the Gateway PBX to inhibit clearing of the PSTN route and insert a modem to enable the call to be remade over a digital DPNSS 1 link to the Terminating PBX.

2.2 INTERWORKING WITH DASS 2

This Paragraph only deals with a Circuit Switched Data Call between a data terminal within a DPNSS l Private Network and DASS 2.

Attention is drawn to Paragraph 1.10 of Section 1 of DPNSS[189-I] which permits the use of Supplementary Information Strings defined for interworking with ISDN signalling protocols to be used in conjunction with other signalling systems with similar characteristics. In particular these Strings may be used instead of, or as well as, the BSS and D-SIC Strings explicitly mentioned below to aid in the mapping between DPNSS 1 and DASS 2 Service Indicator Codes.

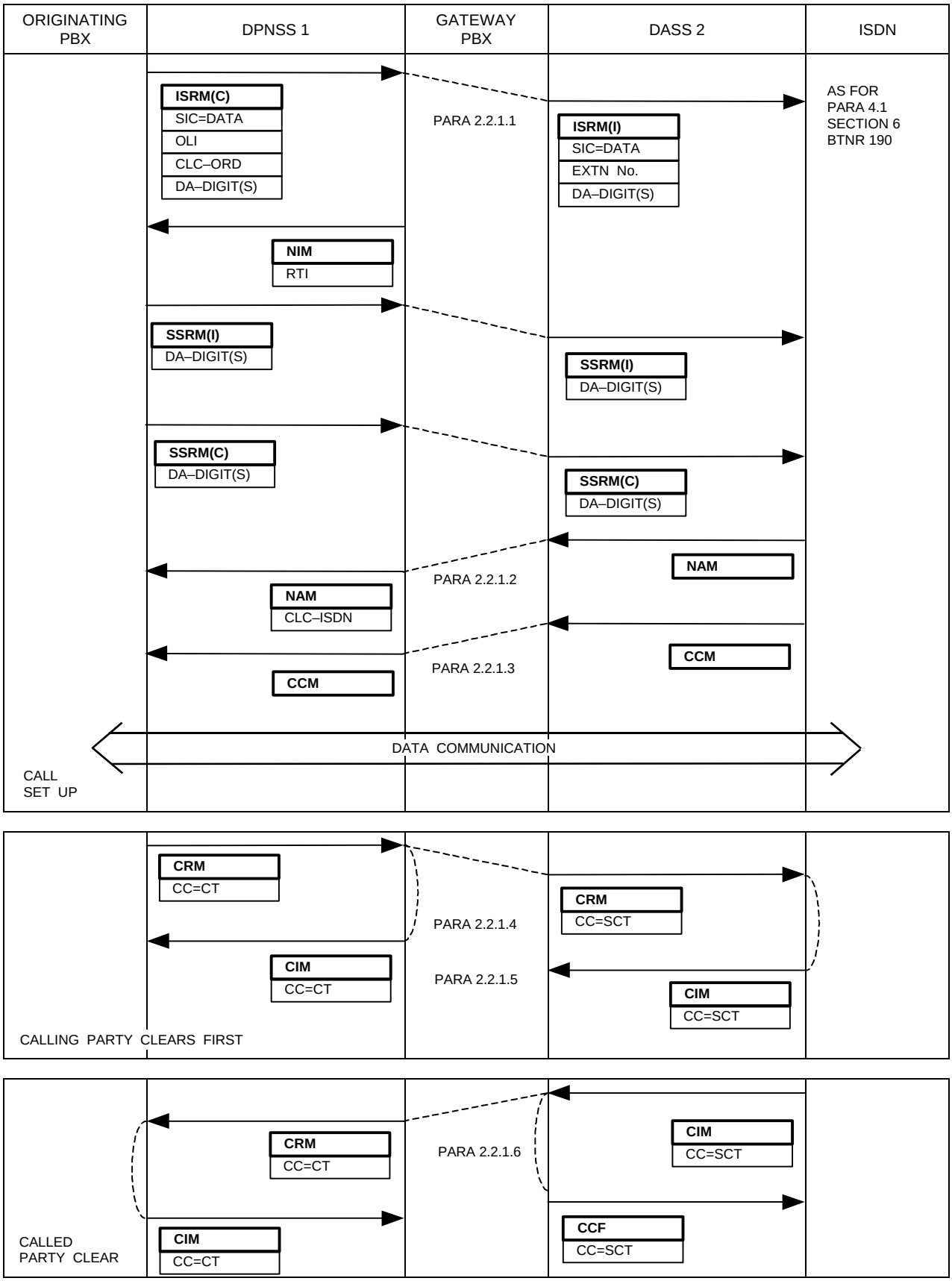
OUTLINE OF OPERATION

The signalling procedures are divided into two parts:

2.2.1 A Circuit Switched Data Call from a DPNSS l data terminal to DASS 2.

2.2.2 A Circuit Switched Data Call from DASS 2 to a DPNSS l data terminal.

2.2.1 CIRCUIT SWITCHED DATA CALL FROM DPNSS 1 TO DASS 2



2.2.l.l When the Destination Address within an ISRM identifies an outgoing DASS 2 route the Gateway PBX reserves a traffic channel to the Local Exchange and sends a DASS 2 ISRM on the signalling channel. The Gateway PBX returns a NIM with Routing Information (RTI) indicating public ISDN encountered to the Originating PBX.

The DASS 2 ISRM, in accordance with BTNR 190, contains the SIC, the calling extension's DDI identity if available and the Destination Address of the required terminal. The calling extension's DDI identity is coded as for the OLI shown in BTNR l90 and must not exceed 6 digits.

NOTE: In general the DASS 2 SIC shall be formed by passing on the DPNSS 1 SIC unchanged. Where, however, the DPNSS 1 SIC coding indicates synchronous data using the codepoint 011 in the data type field, it is recommended that the DASS 2 SIC is encoded using the codepoint 100 in its data type field (as the use of codepoint 011 may be rejected).

Whenever possible a DASS 2 ISRM(Complete) should be used. However, where number length cannot be determined, a DASS 2 ISRM (Incomplete) may be used together with one or more Subsequent Service Request Messages (SSRMs) to send the remaining address information.

2.2.l.2 Receipt of a DASS 2 NAM indicates a successful routing and a DPNSS l NAM is sent to the Originating PBX containing the CLC-ISDN and optionally the Trunk Identity (TID). If the DASS 2 CLI service is subscribed to by the calling party, the DASS 2 NAM will contain the TLI of the called party.

If a TLI containing other than the single character "X" is received in the DASS 2 NAM then it shall be copied into a CLI string in the DPNSS 1 NAM. If the DASS 2 TLI contains any "X" character(s) they shall be discarded.

It should be noted that a CLI in a DPNSS 1 NAM that also contains a CLC-ISDN will represent the Destination Address within the public network. This CLI cannot therefore be used, unchanged, as a Destination Address within the DPNSS 1 network.

As the Public Network does not provide tones and announcements for Category l calls the DPNSS 1 NAM may be used to provide local indications at the Originating PBX when necessary.

If the call fails one of the Clearing Causes shown in Paragraph 4.l.3 of BTNR l90 SECTION 6 will be received in a DASS 2 Clear Indication Message (CIM).

On receipt of the DASS 2 CIM the Gateway PBX will send a DPNSS l CRM towards the Originating PBX. Except in the cases shown below the DASS 2 Clearing Causes contained in the DASS 2 CIM shall be used as the DPNSS 1 Clearing Cause:

DASS 2 Clearing Cause	DPNSS 1 Clearing Cause
Message Not Understood	Network Termination
Service Incompatible	Subscriber Incompatible
Signal Not Understood	Network Termination

NOTE: In view of the above not all Clearing Causes received by DPNSS 1 PBXs will be genuine DPNSS 1 Clearing Causes. However, Originating PBXs, having earlier received RTI indicating DASS 2 encountered, may thus be able to interpret the DASS 2 Clearing Causes correctly.

The Gateway PBX acknowledges the DASS 2 CIM by sending a CCF to the Local Exchange and it expects a CIM from the DPNSS 1 link.

2.2.l.3 On receipt of a DASS 2 CCM (Answer) the Gateway PBX sends a DPNSS l CCM to the Originating PBX.

2.2.l.4 When the caller clears, the DPNSS l links will be released in the normal way with an exchange of CRM and CIM, containing the Clearing Cause: CT.

The Gateway PBX, on receipt of a DPNSS l CRM sends a DASS 2 CRM containing the Clearing Cause: SCT.

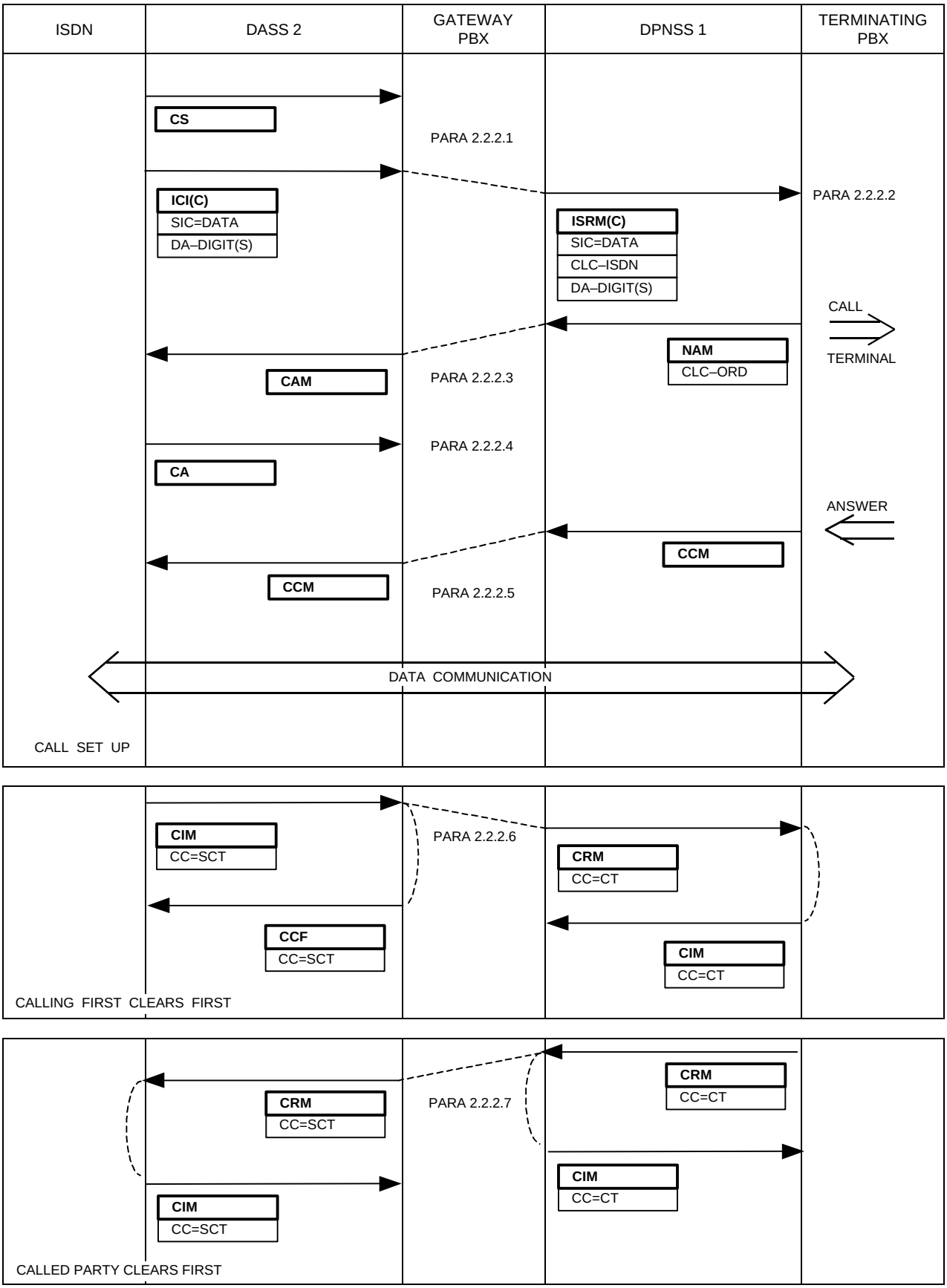
The DPNSS l code for Clearing Cause: CT is the same as the DASS 2 code for Clearing Cause: SCT.

2.2.l.5 The Gateway PBX must retain the address of the now released calling DPNSS l extension until the DASS 2 CIM is received in case the Public Network wishes to hold the connection (eg Call Charge Indication).

Refusal by the Public Network to allow release of the call is indicated by the Local Exchange delaying sending of the Clear Indication Message in response to the DASS 2 CRM.

2.2.l.6 Receipt of a DASS 2 CIM containing the Clearing Cause: SCT indicates that the called party has cleared. The Gateway PBX will send a CRM containing the Clearing Cause: CT to the Originating PBX, and acknowledge the DASS 2 CIM with a CCF.

2.2.2 CIRCUIT SWITCHED DATA CALL FROM DASS 2 TO DPNSS 1



2.2.2.l On receipt of a Channel Seize (CS) message, the Gateway PBX reserves the transmission channel.

When the DDI digits in the DASS 2 ICI identify an outgoing DPNSS l route the Gateway PBX reserves a transmission channel on the required route and sends a DPNSS l ISRM on the signalling channel.

If the ICI has no Destination Address the call shall be routed to a NON DDI Answer Point which has been previously arranged. The Destination Address in the DPNSS 1 ISRM will be the Private Network number of the Answer Point.

The DPNSS l ISRM contains the SIC, the Destination Address and the Calling Line Category CLC-ISDN.

In addition if an OLI String containing other than the single character "X" is received from DASS 2, It shall be copied into an OLI String in the DPNSS 1 ISRM. If the DASS 2 OLI contains any "X" characters they shall be discarded.

It should be noted that an OLI in a DPNSS 1 ISRM that also contains a CLC-ISDN will represent the Destination Address within the public network. This OLI cannot therefore be used, unchanged, as a Destination Address within the DPNSS 1 network.

A Trunk Identity String (TID) may optionally be included in the DPNSS 1 ISRM.

NOTE: As the SIC in the DASS 2 ICI indicated Data (Cat l) a Data Call will be requested on DPNSS l and the two octet SIC will be repeated unchanged.

If a single octet DATA SIC is received the call shall be allowed to continue with the single octet SIC being repeated unchanged. Acceptance or rejection of the SIC will be done by the Terminating PBX.

2.2.2.2 On receipt of an ISRM with a CLC-ISDN, the Terminating PBX performs an SIC compatibility check. If the called terminal is compatible with the SIC and is free it is presented with the call. If the call is accepted then a NAM containing the CLI and CLC is returned in the signalling channel.

If the call fails for any reason a CRM will be sent containing one of the Clearing Causes detailed in DPNSS[188] SECTION 7 Paragraph 2.3.l.2.

2.2.2.3 On receipt of a DPNSS l NAM the Gateway PBX sends a DASS 2 Call Accepted Message (CAM) to the Local Exchange to indicate that the requested terminal is compatible, free and has accepted the call. The DDI extension number of the called party is contained in the DASS 2 CAM, which is coded as shown in BTNR 190.

On receipt of a DPNSS l CRM indicating call failure, a CIM is returned to the Terminating PBX and a DASS 2 CRM is sent. The mapping between the DPNSS 1 Clearing Cause and the DASS 2 Clearing Cause is shown below:

DPNSS 1 Clearing Cause	**DASS 2 Clearing Causes**
Subscriber Incompatible	Service Incompatible
Congestion	Subscriber Engaged
Busy	Subscriber Engaged
Service Incompatible	Service Incompatible
NAE Error	NAE Error
DTE Controlled Not Ready	DTE Controlled Not Ready
DTE Uncontrolled Not Ready	DTE Uncontrolled Not Ready

Any DPNSS 1 Clearing Causes that are not listed above shall be mapped onto the DASS 2 Clearing Cause: NU except in the following cases:

If the DPNSS 1 CRM contains CC: SU accompanied by String SU with parameter BSS-M then, the DASS 2 Clearing Cause shall be Service Incompatible.

If the DPNSS 1 CRM contains CC: SNU accompanied by String SNU with parameter BSS-M, then the DASS 2 Clearing Cause shall be Service Incompatible.

A CIM is expected in response from the Public Network.

2.2.2.4 The Local Exchange connects the call and sends a Call Arrival message. The Gateway PBX discards this message.

2.2.2.5 When the called terminal answers, the Terminating PBX sends a DPNSS l CCM. The Gateway PBX repeats this information as a DASS 2 CCM. If a DASS 2 Call Arrival (CA) message has not been received the CCM must be withheld until the CA has been received.

2.2.2.6 On Receipt of a DASS 2 CIM the Gateway PBX returns a DASS 2 CCF. The DPNSS l path will be released in the normal way with an exchange of CRM and CIM.

2.2.2.7 When the called party clears, the DPNSS l path will be released in the normal way with an exchange of CRM and CIM. The Gateway PBX on receipt of the DPNSS l CRM sends a DASS 2 CRM and expects a DASS 2 CIM in response.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED.

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

2.4.1 General

As a Decadic route does not provide the Circuit Switched Data Call Service there is no special Decadic signalling involved.

However, if a PBX acting as a DPNSS 1 Gateway to a Decadic route receives an ISRM containing SIC=DATA the request may be allowed under certain circumstances; see Paragraph 2.4.2.

Additionally, if an ISRM containing CLC-DEC is received at a DPNSS 1 Terminating PBX and which is recognised as being destined for a data terminal, the request may be allowed under certain circumstances; see Paragraph 2.4.3.

2.4.2 Data Call from a DPNSS 1 Terminal to a Decadic Route

When an ISRM containing SIC=DATA is received at a Gateway PBX from a DPNSS 1 data terminal there are three cases to consider:

2.4.2.1 In the case where the DPNSS 1 traffic channel incoming to the Gateway is analogue the call shall be treated by the Gateway as a Simple Telephony Call interworking with a Decadic route (see SECTION 6, Paragraph 2.4.1).

2.4.2.2 In the case where the DPNSS 1 traffic channel incoming to the Gateway is digital and where a modem is available at the Gateway to suit the DATA SIC the modem shall be inserted and the call treated as a Simple Telephony Call interworking with a Decadic route (see SECTION 6, Paragraph 2.4.1).

2.4.2.3 In the case where the DPNSS 1 traffic channel incoming to the Gateway is digital and where a modem is not available at the Gateway to suit the DATA SIC, the call shall be rejected with a CRM containing the Clearing Cause: INC; and optionally Supplementary Information String CLC-DEC.

A new call could automatically be made using a suitable modem provided at the Originating PBX. In this case the new call will be made as a telephony call (SIC=TELE).

2.4.3 Call from a Decadic Route to a DPNSS 1 Data Terminal

When an ISRM containing CLC-DEC is received at a Terminating PBX and which is recognised as a call destined for a DPNSS 1 Data Terminal there are two cases to be considered:

2.4.3.1 In the case where a suitable modem is available at the Terminating PBX the modem shall be inserted and the call treated as a Simple Telephony Call interworking with a Decadic route (see SECTION 6, Paragraph 2.4.2).

2.4.3.2 If a suitable modem is not available at the Terminating PBX the call shall be rejected with a CRM containing the Clearing Cause: SI and Supplementary String SIC with a Parameter SIC corresponding to the characteristics of the wanted data terminal.

The SIC returned in the CRM may be used by the Gateway PBX to inhibit clearing of the Decadic route and insert a modem to enable the call to be remade over a digital DPNSS 1 link to the Terminating PBX.

2.5 INTERWORKING WITH SSMF5

2.5.1 General

SSMF5 does not specify a Circuit Switched Data Call, but it does provide the means of indicating that a call originates from Data transmission equipment. With the exception of sending Signal II-6 (Data Transmission Equipment) instead of II-1 (Ordinary) there is no special SSMF5 signalling involved when interworking with the DPNSS 1 Circuit Switched Data Call.

If a PBX acting as a DPNSS 1 Gateway to an SSMF5 route receives an ISRM containing SIC=DATA the request may be allowed under certain circumstances; see Paragraph 2.5.2.

Additionally, if an ISRM containing CLC-MF5 is received at a DPNSS 1 Terminating PBX and which is recognised as being destined for a data terminal, the request may be allowed under certain circumstances; see Paragraph 2.5.3.

2.5.2 Data Call from a DPNSS 1 Terminal to an SSMF5 Route

When an ISRM containing SIC=DATA is received at a Gateway PBX from a DPNSS 1 data terminal there are three cases to consider:

2.5.2.1 In the case where the DPNSS 1 traffic channel incoming to the Gateway is analogue the call shall be treated as a Simple Telephony Call interworking with an SSMF5 route (see SECTION 6, Paragraph 2.5.1 (Basic) or 2.5.3 (Enhanced)) with the exception of the use of the SSMF5 signal II-6 instead of II-1.

2.5.2.2 In the case where the DPNSS 1 traffic channel incoming to the Gateway is digital and where a modem is available at the Gateway to suit the DATA SIC the call shall be treated as a Simple Telephony call interworking with an SSMF5 route (see SECTION 6, Paragraph 2.5.1 (Basic) or 2.5.3 (Enhanced)) with the exception of the use of the SSMF5 signal II-6 instead of II-1.

2.5.2.3 In the case where the DPNSS 1 traffic channel incoming to the Gateway is digital and where a modem is not available at the Gateway to suit the DATA SIC, the call shall be rejected with a CRM containing the Clearing Cause: INC and, optionally, Supplementary Information String CLC-MF5.

A new call could automatically be made using a suitable modem provided at the Originating PBX. In this case the new call will be made as a Telephony call (SIC=TELE).

2.5.3 Call from an SSMF5 Route to a DPNSS 1 Data Terminal

When an ISRM containing CLC-MF5 is received at a Terminating PBX and which is recognised as a call destined for a DPNSS 1 Data Terminal there are two cases to be considered:

2.5.3.1 In the case where a suitable modem is available at the Terminating PBX the call shall be treated as a Simple Telephony Call interworking with an SSMF5 route (see SECTION 6, Paragraph 2.5.2 (Basic) or 2.5.4 (Enhanced).

2.5.3.2 If a suitable modem is not available at the Terminating PBX the call shall be rejected with a CRM containing the Clearing Cause: SI and Supplementary Information String SIC with a Parameter SIC corresponding to the characteristics of the wanted data terminal.

The SIC returned in the CRM may be used by the Gateway PBX to inhibit clearing of the SSMF5 route and insert a modem to enable the call to be remade over a digital DPNSS 1 link to the Terminating PBX.

NOTE: When the Gateway PBX receives the SSMF5 signal II-6, it will send an ISRM containing SIC=TELE.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 8 - SUPPLEMENTARY SERVICE : SWAP

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HISTORY

Issue 1 - May 1985
Issue 2 - March 1988

Issue 3 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7
BTNR 190 Issue 2

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Swap Supplementary Service.

1.2 Subsection 2 details the Swap Supplementary Service when DPNSS 1 interworks with other signalling systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of Messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

2.1.1 General

As the PSTN does not provide the Swap Supplementary Service there is no special PSTN signalling involved.

However, taking account of the limitations imposed by the nature of the PSTN, it is possible to provide a restricted Swap Service based on the principles described in DPNSS[188] SECTION 8.

As there are no end to end Swap signals on the PSTN, if such a service is to be provided when interworking with the PSTN, then:

i. A call originally set up with a Telephony Service SIC as defined in DPNSS[188] SECTION 6 could be converted to a Data Call, as defined in DPNSS[188] SECTION 7, by verbal agreement and subsequent signalling between the DPNSS 1 requesting PBX and the PSTN Gateway PBX; see Paragraph 2.1.2.

ii. A call originally set up with a Data SIC, as defined in DPNSS[188] SECTION 7, could be converted to a Telephony Call, as defined in DPNSS[188] SECTION 6, by an exchange of data signals over the traffic channels and subsequent signalling between the DPNSS 1 requesting PBX and the PSTN Gateway PBX; see Paragraph 2.1.3.

iii. A call originally set up with one Data SIC could be converted to a call with a different Data SIC by exchange of data signals over the traffic channels and subsequent signalling between the DPNSS 1 requesting PBX and the PSTN Gateway PBX; see Paragraph 2.1.4.

NOTE: If interworking two DPNSS 1 networks via the PSTN the following applies to each end of the call independently.

2.1.2 Telephony to Data

2.1.2.1 Following a verbal agreement to swap to Data a check is made at the DPNSS 1 requesting PBX on whether a modem is available to suit the required Data SIC.

If a modem is available at the requesting PBX there will be no need to invoke the Swap Service and the call can proceed, after connection of the modem, as a Simple Telephony Call interworking with the PSTN (see SECTION 6).

If a modem is not available at the requesting PBX then the Swap Service is invoked and an SM containing SIC=DATA and Swap Validation (SW-V) is sent to the Gateway PBX. Any equipment which will be needed when the new service comes into use shall be reserved before sending the message.

On receipt of a response to the Swap Validation Request the requesting PBX acts as detailed in DPNSS[188] SECTION 8 Paragraph 2.3.1.5.

If data synchronisation is not achieved within a reasonable time users should revert to voice in a mutually agreed manner.

2.1.2.2 On receipt of the SM containing string SW-V the Gateway PBX shall check if a modem is available to suit the new SIC.

If the required modem is available then the change shall be carried out and an SM containing the new SIC and the String ACK shall be sent to the requesting PBX. This may involve changes to the traffic channels at the transits concerned (eg insertion of pads, connection of modems, etc).

If a suitable modem is not available then the call shall be left in the previous state and an SM containing the String SW-R sent to the requesting PBX to indicate that the necessary equipment is not available (Parameter = E).

2.1.3 Data To Telephony

2.1.3.1 Following an exchange of messages on the data channel, agreeing to swap to telephony, a check is made at the requesting DPNSS 1 PBX whether the Data Service was originally provided by means of a modem at the requesting PBX or at the Gateway PBX.

If the Data Service was provided by means of a modem at the DPNSS 1 requesting PBX then it is not necessary to invoke the Swap Service. The modem can be removed and the subsequent call treated as a Simple Telephony Call interworking with the PSTN (see SECTION 6).

If the Data Service was provided by means of a Modem at the Gateway PBX then the Swap Service is invoked and an SM containing SIC=TELE and String SW-V is sent from the DPNSS 1 requesting PBX to the Gateway PBX. Any equipment which will be needed when the new service comes into use shall be reserved before sending the message.

On receipt of a response to the Swap Validation Request the requesting PBX acts as detailed in DPNSS[188] SECTION 8 Paragraph 2.3.1.5.

2.1.3.2 On receipt of the SM containing String SW-V the Gateway PBX shall check that a codec is available to suit the new SIC.

If the required codec is available then the change shall be carried out (by inserting the codec and removing the modem) and an SM containing the new SIC and the String ACK shall be sent to the requesting PBX. This may involve changes to the traffic channels at the transits concerned (removal of pads, modems, etc).

If a suitable codec is not available then the call shall be left in the previous state and an SM containing the String SW-R shall be sent to the requesting PBX to indicate that the necessary equipment is not available (Parameter = E).

2.1.4 Change of Data SIC

2.1.4.1 Following an exchange of messages on the data channel agreeing to swap to a new Data Service a check is made at the requesting DPNSS 1 PBX whether the original Data Service was provided by means of a modem at the requesting PBX or at the Gateway PBX.

If the original Data Service was provided by means of a modem at the DPNSS 1 requesting PBX a further check is made whether a modem to suit the new SIC is available at the requesting PBX.

If a modem to suit the new SIC is available at the requesting PBX then there is no need to invoke the Swap Service; the change can be made and the call continued in accordance with the new SIC.

If either, a modem to suit the new SIC is not available at the requesting PBX, or, if the original Data Call was set up by means of a modem at the Gateway PBX then the Swap Service is invoked. An SM containing the new SIC and String SW-V is sent from the requesting DPNSS 1 PBX to the Gateway PBX. Any equipment which will be needed

when the new service comes into use shall be reserved before sending the message.

On receipt of a response to the Swap Validation Request the requesting PBX acts as detailed in DPNSS[188] SECTION 8 Paragraph 2.3.1.5.

If data synchronisation is not achieved within a reasonable time users should revert to the original data mode in a mutually agreed manner.

2.1.4.2 On receipt of the SM containing String SW-V the Gateway PBX shall check whether a modem is available to suit the new SIC.

If the required modem is available then the change shall be carried out and an SM containing the new SIC and the String ACK shall be sent to the requesting PBX. This may involve changes to the traffic channels at the transits concerned (eg changes to modems, etc).

If a suitable modem is not available then the call shall be left in the previous state and an SM containing the String SW-R be sent to the requesting PBX to indicate that the necessary equipment is not available (Parameter = E).

2.2 INTERWORKING WITH DASS 2

DASS 2 provides the Swap Supplementary Service on Category 1 and Category 2 calls but not on "Telephony" calls. Interworking between the DPNSS 1 and DASS 2 Swap Supplementary Services is detailed in this paragraph.

In the case of a DASS 2 Telephony call a limited DPNSS 1 Swap capability can be provided by using a procedure similar to that defined for interworking with the PSTN (see Paragraph 2.1).

OUTLINE OF OPERATION

The signalling procedures are divided into two parts:

2.2.1 A Swap request from DPNSS 1 to DASS 2

2.2.2 A Swap request from DASS 2 to DPNSS 1

2.2.1 Swap Request from DPNSS 1 to DASS 2

2.2.1.1 On receipt of a DPNSS 1 SM the Gateway PBX determines whether the outgoing DASS 2 path can support the requested service. If the service can be supported

it sends a DASS 2 SM on the DASS 2 path indicating the required SIC.

If the service cannot be supported on the outgoing path the Gateway PBX returns a DPNSS 1 SM containing the existing SIC, the String Swap Rejection (SW-R) indicating that the path is not suitable (Parameter = P) and the call is left in its previous state.

2.2.1.2 If the Swap request is successful the returned DASS 2 SM will indicate the new SIC. The Gateway PBX shall send a DPNSS 1 SM containing the new SIC and the String ACK to the requesting PBX.

If the swap request is unsuccessful, the DASS 2 SM received will contain a SIC which does not indicate the requested service. The Gateway PBX will send a DPNSS 1 SM containing the existing SIC and the string SW-R, the call remains in the previous state. The parameter to the string should be (T) if the SIC received is the same as the original SIC indicating that the called terminal cannot support the service requested, otherwise it should be (I) to indicate that the DASS 2 swap requests have crossed.

If the Swap request is rejected by means of a DASS 2 UDC message, then the Gateway PBX will send a DPNSS 1 SM containing the existing SIC and the call will remain in its previous state. The contents of the Indication field of the DPNSS 1 SM will depend upon the control field of the DASS 2 UDC message as follows:

i. A control field of 3 indicates that the path through the ISDN network cannot support the service. In this case String SW-R will be included with Parameter (P).

ii. A control field of 4 indicates that flow control has been invoked for Swap requests on this call. In this case string SW-R will be included with Parameter (I).

iii. A control field of 6 indicates that the swap has been rejected because a phase 1 NTE has been encountered. In this case string SW-R will be included with Parameter(T).

iv. A control field of 7 indicates that the SIC sent in the DASS 2 SM is deemed invalid by the ISDN. In this case String SNU will be included with a parameter (S).

If no response is received to the DASS 2 SM within the timeout period, the same action as for receipt of a UDC with a control field containing 4 is taken.

2.2.2 Swap Request from DASS 2 to DPNSS 1

2.2.2.1 On receipt of a DASS 2 SM the Gateway PBX determines whether the outgoing path can support the requested service. If the service can be supported it sends a DPNSS 1 SM containing the new SIC and the String SW-V on the DPNSS 1 path.

If the service cannot be supported on the outgoing DPNSS 1 path the Gateway PBX returns a DASS 2 SM with the SIC of the existing call and the call is left in its previous state.

2.2.2.2 If the Swap request is successful the returned DPNSS 1 SM will contain the new SIC and the String ACK. The Gateway PBX will send a DASS 2 SM containing the new SIC on the DASS 2 path.

If the Swap request is unsuccessful the DPNSS 1 SM received will contain an SIC with the existing service indicated, and the String SW-R. The Parameter of this String indicating the reason for the rejection shall be ignored by the Gateway PBX. The Gateway shall send a DASS 2 SM containing the existing SIC on the DASS 2 path and the call will remain in its previous state.

If swap requests cross, a DPNSS 1 SM containing the string SW-V will be received. In this case the DPNSS 1 channel shall be handled in accordance with the procedure for crossing swap requests as defined in DPNSS[188] and the Gateway PBX shall send a DASS 2 SM containing the existing SIC on the DASS 2 path and the call will remain in the previous state.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

2.4.1 General

As a Decadic route does not provide the Swap Supplementary Service there is no special Decadic signalling involved.

However, taking account of the limitations imposed by the analogue nature of a Decadic route, it is possible to provide a restricted Swap Service based on the principles described in DPNSS[188] SECTION 8.

As there are no end to end Swap signals on a Decadic route, if such a service is to be provided when interworking with a Decadic route then:

i. A call originally set up with a Telephony Service SIC as defined in DPNSS[188] SECTION 6 could be converted to a Data Call, as defined in DPNSS[188] SECTION 7, by verbal agreement and subsequent signalling between the DPNSS 1 requesting PBX and the Decadic Gateway PBX; see Paragraph 2.4.2.

ii. A call originally set up with a Data SIC, as defined in DPNSS[188] SECTION 7, could be converted to a Telephony Call, as defined in DPNSS[188] SECTION 6, by an exchange of data signals over the traffic channels and subsequent signalling between the DPNSS 1 requesting PBX and the Decadic Gateway PBX; see Paragraph 2.4.3.

iii. A call originally set up with one Data SIC could be converted to a call with a different Data SIC by exchange of data signals over the traffic channels and subsequent signalling between the DPNSS 1 requesting PBX and the Decadic Gateway PBX; see Paragraph 2.4.4.

NOTE: If interworking two DPNSS 1 networks via a Decadic route the following applies to each end of the call independently.

2.4.2 Telephony to Data

2.4.2.1 Following a verbal agreement to swap to Data a check is made at the DPNSS 1 requesting PBX on whether a modem is available to suit the required Data SIC.

If a modem is available at the requesting PBX there will be no need to invoke the Swap Service and the call can proceed, after connection of the modem, as simple telephony call interworking with a Decadic route (see SECTION 6).

If a modem is not available at the requesting PBX then the Swap Service is invoked and an SM containing SIC=DATA and Swap Validation (SW-V) is sent to the Gateway PBX. Any equipment which will be needed when the new service comes into use shall be reserved before sending the message.

On receipt of a response to the Swap Validation Request the requesting PBX acts as detailed in DPNSS[188] SECTION 8 Paragraph 2.3.1.5.

If data synchronisation is not achieved within a reasonable time users should revert to voice in a mutually agreed manner.

2.4.2.2 On receipt of the SM containing string SW-V the Gateway PBX shall check if a modem is available to suit the new SIC.

If the required modem is available then the change shall be carried out and an SM containing the new SIC and the String ACK shall be sent to the requesting PBX. This may involve changes to the traffic channels at the transits concerned (eg insertion of pads, connection of modems, etc).

If a suitable modem is not available then the call shall be left in the previous state and an SM containing the String SW-R sent to the requesting PBX to indicate that the necessary equipment is not available (Parameter = E).

2.4.3 Data To Telephony

2.4.3.1 Following an exchange of messages on the data channel agreeing to swap to telephony, a check is made at the requesting DPNSS 1 PBX whether the Data Service was originally provided by means of a modem at the requesting PBX or at the Gateway PBX.

If the Data Service was provided by means of a modem at the DPNSS 1 requesting PBX then it is not necessary to invoke the Swap Service. The modem can be removed and the subsequent call treated as a Simple Telephony Call interworking with a Decadic route (see SECTION 6).

If the Data Service was provided by means of a modem at the Gateway PBX then the Swap Service is invoked and an SM containing SIC=TELE and String SW-V is sent from the DPNSS 1 requesting PBX to the Gateway PBX. Any equipment which will be needed when the new service comes into use shall be reserved before sending the message.

On receipt of a response to the Swap Validation Request the requesting PBX acts as detailed in DPNSS[188] SECTION 8 Paragraph 2.3.1.5.

2.4.3.2 On receipt of the Swap Message containing String SW-V the Gateway PBX shall check that a codec is available to suit the new SIC.

If the required codec is available then the change shall be carried out (by inserting the codec and removing the modem) and an SM containing the new SIC and the String ACK shall be sent to the requesting PBX. This may involve changes to the traffic channels at the transits concerned (removal of pads, modems, etc).

If a suitable codec is not available then the call shall be left in the previous state and an SM containing the String SW-R sent to the requesting PBX to indicate that the necessary equipment is not available (Parameter = E).

2.4.4 Change of Data SIC

2.4.4.1 Following an exchange of messages on the data channel agreeing to swap to a new Data Service a check is made at the requesting DPNSS 1 PBX whether the original Data Service was provided by means of a modem at the requesting PBX or at the Gateway PBX.

If the original Data Service was provided by means of a modem at the DPNSS 1 requesting PBX a further check is made whether a modem to suit the new SIC is available at the requesting PBX.

If a modem to suit the new SIC is available at the requesting PBX then there is no need to invoke the Swap Service; the change can be made and the call continued in accordance with the new SIC.

If either, a modem to suit the new SIC is not available at the requesting PBX, or, if the original data call was set up by means of a modem at the Gateway PBX then the Swap Service is invoked. An SM containing the new SIC and String SW-V is sent from the requesting DPNSS 1 PBX to the Gateway PBX. Any equipment which will be needed when the new service comes into use shall be reserved before sending the message.

On receipt of a response to the Swap Validation Request the requesting PBX acts as detailed in DPNSS[188] SECTION 8 Paragraph 2.3.1.5.

If data synchronisation is not achieved within a reasonable time users should revert to the original data mode in a mutually agreed manner.

2.4.4.2 On receipt of the SM containing String SW-V the Gateway PBX shall check whether a modem is available to suit the new SIC.

If the required modem is available then the change shall be carried out and an SM containing the new SIC and the String ACK shall be sent to the requesting PBX. This may involve changes to the traffic channels at the transits concerned (eg changes to modems, etc).

If a suitable modem is not available then the call shall be left in the previous state and an SM containing the String SW-R sent to the requesting PBX to indicate that the necessary equipment is not available (Parameter = E).

2.5 INTERWORKING WITH SSMF5

2.5.1 General

As an SSMF5 route does not provide the Swap Supplementary Service there is no special SSMF5 signalling involved.

However, taking account of the limitations imposed by the analogue nature of an SSMF5 route, it is possible to provide a restricted Swap Service based on the principles described in DPNSS[188] SECTION 8.

As there are no end to end Swap signals on an SSMF5 route, if such a service is to be provided when interworking with an SSMF5 route then:

i. A call originally set up with a Telephony Service SIC as defined in DPNSS[188] SECTION 6 could be converted to a Data Call, as defined in DPNSS[188] SECTION 7, by verbal agreement and subsequent signalling between the DPNSS 1 requesting PBX and the SSMF5 Gateway PBX; see Paragraph 2.5.2.

ii. A call originally set up with a Data SIC, as defined in DPNSS[188] SECTION 7, could be converted to a Telephony Call, as defined in DPNSS[188] SECTION 6, by an exchange of data signals over the traffic channels and subsequent signalling between the DPNSS 1 requesting PBX and the SSMF5 Gateway PBX; see Paragraph 2.5.3.

iii. A call originally set up with one Data SIC could be converted to a call with a different Data SIC by exchange of data signals over the traffic channels and subsequent signalling between the DPNSS 1 requesting PBX and the SSMF5 Gateway PBX; see Paragraph 2.5.4.

NOTE: If interworking two DPNSS 1 networks via an SSMF5 route the following applies to each end of the call independently.

2.5.2 Telephony to Data

2.5.2.1 Following a verbal agreement to swap to Data a check is made at the DPNSS 1 requesting PBX on whether a modem is available to suit the required Data SIC.

If a modem is available at the requesting PBX there will be no need to invoke the Swap Service and the call can proceed, after connection of the modem, as simple telephony call interworking with an SSMF5 route (see SECTION 6).

If a modem is not available at the requesting PBX then the Swap Service is invoked and an SM containing SIC=DATA and Swap Validation (SW-V) sent to the Gateway PBX. Any equipment which will be needed when the new service comes into use shall be reserved before sending the message.

On receipt of a response to the Swap Validation Request the requesting PBX acts as detailed in DPNSS[188] SECTION 8 Paragraph 2.3.1.5.

If data synchronisation is not achieved within a reasonable time users should revert to voice in a mutually agreed manner.

2.5.2.2 On receipt of the SM containing string SW-V the Gateway PBX shall check if a modem is available to suit the new SIC.

If the required modem is available then the change shall be carried out and an SM containing the new SIC and the String ACK shall be sent to the requesting PBX. This may involve changes to the traffic channels at the transits concerned (eg insertion of pads, connection of modems, etc).

If a suitable modem is not available then the call shall be left in the previous state and an SM containing the String SW-R sent to the requesting PBX to indicate that the necessary equipment is not available (Parameter = E).

2.5.3 Data To Telephony

2.5.3.1 Following an exchange of messages on the data channel, agreeing to swap to telephony, a check is made at the requesting DPNSS 1 PBX whether the Data Service was originally provided by means of a modem at the requesting PBX or at the Gateway PBX.

If the Data Service was provided by means of a modem at the DPNSS 1 requesting PBX then it is not necessary to invoke the Swap Service. The modem can be removed and the subsequent call treated as a Simple Telephony Call interworking with an SSMF5 route (see SECTION 6).

If the Data Service was provided by means of a Modem at the Gateway PBX then the Swap Service is invoked and an SM containing SIC=TELE and String SW-V sent from the DPNSS 1 requesting PBX to the Gateway PBX. Any equipment which will be needed when the new service comes into use shall be reserved before sending the message.

On receipt of a response to the Swap Validation Request the Requesting PBX acts as detailed in DPNSS[188] SECTION 8 Paragraph 2.3.1.5.

2.5.3.2 On receipt of the SM containing String SW-V the Gateway PBX shall check that a codec is available to suit the new SIC.

If the required codec is available then the change shall be carried out (by inserting the codec and removing the modem) and an SM containing the new SIC and the String ACK shall be sent to the requesting PBX. This may involve changes to the traffic channels at the transits concerned (removal of pads, modems, etc).

If a suitable codec is not available then the call shall be left in the previous state and an SM containing the String SW-R sent to the requesting PBX to indicate that the necessary equipment is not available (Parameter = E).

2.5.4 Change of Data SIC

2.5.4.1 Following an exchange of messages on the data channel agreeing to swap to a new Data Service a check is made at the requesting DPNSS 1 PBX whether the original Data Service was provided by means of a modem at the requesting PBX or at the Gateway PBX.

If the original Data Service was provided by means of a modem at the DPNSS 1 requesting PBX a further check is

made whether a modem to suit the new SIC is available at the requesting PBX.

If a modem to suit the new SIC is available at the requesting PBX then there is no need to invoke the Swap Service; the change can be made and the call continued in accordance with the new SIC.

If either, a modem to suit the new SIC is not available at the requesting PBX, or, if the original data call was set up by means of a modem at the Gateway PBX then the Swap Service is invoked. An SM containing the new SIC and String SW-V sent from the requesting DPNSS 1 PBX to the Gateway PBX. Any equipment which will be needed when the new service comes into use shall be reserved before sending the message.

On receipt of a response to the Swap Validation Request the Requesting PBX acts as detailed in DPNSS[188] SECTION 8 Paragraph 2.3.1.5.

If data synchronisation is not achieved within a reasonable time users should revert to the original data mode in a mutually agreed manner.

2.5.4.2 On receipt of the SM containing String SW-V the Gateway PBX shall check whether a modem is available to suit the new SIC.

If the required modem is available then the change shall be carried out and an SM containing the new SIC and the String ACK shall be sent to the requesting PBX. This may involve changes to the traffic channels at the transits concerned (eg changes to modems, etc).

If a suitable modem is not available then the call shall be left in the previous state and an SM containing the String SW-R sent to the requesting PBX to indicate that the necessary equipment is not available (Parameter = E).

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 9 - SUPPLEMENTARY SERVICE : CALL BACK WHEN FREE

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HISTORY

Issue 1 - May 1985
Issue 2 - March 1988

Issue 3 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Call Back When Free Supplementary Service.

1.2 Subsection 2 details the Call Back When Free Supplementary Service when DPNSS 1 interworks with other signalling systems. In general the description is given in the form of explanatory text but in the case of SSMF5 Message Sequence Diagrams (MSDs) are also included.

1.3 Alternative action (eg for unsuccessful calls) not shown in MSDs is given in the accompanying text. The text is referred to in the MSDs at appropriate points in the sequences.

1.4 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide the Call Back When Free Supplementary Service, there is no PSTN signalling involved.

2.1.1 A DPNSS 1 extension involved in a call to a PSTN customer (eg receiving busy tone) will have a Call Back When Free Request rejected by the Originating PBX.

2.1.2 If a PBX acting as a Gateway to the PSTN receives an ISRM containing CBWF-R, CBWF-C, CBWF-FN, CBWF-CSUI or CBWF-CSUD then the call should be rejected by sending a CRM containing Clearing Cause: SSI and optionally CLC-PSTN. A CIM will be expected in response.

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide the Call Back When Free Supplementary Service, there is no DASS 2 signalling involved.

2.2.1 A DPNSS 1 extension involved in a call to a busy DASS 2 customer will have a Call Back When Free Request rejected by the Originating PBX.

2.2.2 If a PBX acting as a Gateway to DASS 2 receives an ISRM containing CBWF-R, CBWF-C, CBWF-FN CBWF-CSUI or CBWF-CSUD then the call should be rejected by sending a CRM containing Clearing Cause: SSI and optionally CLC-ISDN. A CIM will be expected in response.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

As a Decadic route does not provide the Call Back When Free Supplementary Service there is no Decadic signalling involved.

2.4.1 A DPNSS 1 extension involved in a call to a Decadic extension (eg receiving busy tone) will have a Call Back When Free Request rejected by the Originating PBX.

2.4.2 If a PBX acting as a Gateway to Decadic receives an ISRM containing CBWF-R, CBWF-C, CBWF-FN CBWF-CSUI or CBWF-CSUD then the call should be rejected by sending a CRM containing Clearing Cause: Signalling System Incompatible (SSI) and optionally CLC-DEC. A CIM will be expected in response.

2.5 INTERWORKING WITH SSMF5 (SSMF5 Call Back Supplementary Service Supported)

Call Back is an optional Supplementary Service in SSMF5. This paragraph details the requirements for interworking between DPNSS 1 and SSMF5 when the Gateway PBX supports the DPNSS 1 Call Back When Free Supplementary Service and the SSMF5 Call Back Supplementary Service.

There are two methods of providing automatic Call Back in SSMF5 networks:

i. Call Back Request

An extension, on encountering busy, makes a Call Back Request. When the required extension becomes free its PBX makes a "Call Back Attempt" to the requesting extension (ie in the opposite direction to the original call).

ii. Free Notification Request

An extension, on encountering busy, makes a "Free Notification Request". When the required extension becomes free its PBX makes a "Free Notification Call" to the requesting PBX. On receipt of the Free Notification the requesting PBX makes a "Reverted Call Back Call" to the required extension (ie in the same direction as the original call).

DPNSS 1 is more compatible with the "Free Notification Request approach" and the signalling sequences shown in Paragraphs 2.5.1 to 2.5.8 below are based on this method of working. Signalling sequences in Paragraphs 2.5.9 and 2.5.10 show interworking with the "Call Back Request" method of working when the SSMF5 party requests Call Back. The sequences showing the DPNSS 1 party requesting Call Back are under study.

For satisfactory interworking of the service the DPNSS 1 and SSMF5 methods must be compatible both at the Gateway PBX and throughout the two parts of the network. The purchaser should note that because of the alternative possibilities within SSMF5 the general compliance statement in the Foreword of this specification is not fully applicable to the Call Back When Free Supplementary Service interworking with SSMF5. Care must be taken to ensure that a compatible solution is specified.

OUTLINE OF OPERATION

The Call Back When Free Supplementary Service interworking with SSMF5 is provided by the following signalling sequences:

2.5.1 Call Back When Free - Request from DPNSS 1 to SSMF5

2.5.2 Call Back When Free - Free Notification From SSMF5 to DPNSS 1

2.5.3 Call Back When Free - Call Set Up From DPNSS 1 to SSMF5

2.5.4 Call Back When Free - Cancel Request from DPNSS 1 to SSMF5

2.5.5 Call Back When Free - Free Notification Request from SSMF5 to DPNSS 1

2.5.6 Call Back When Free - Free Notification from DPNSS 1 to SSMF5

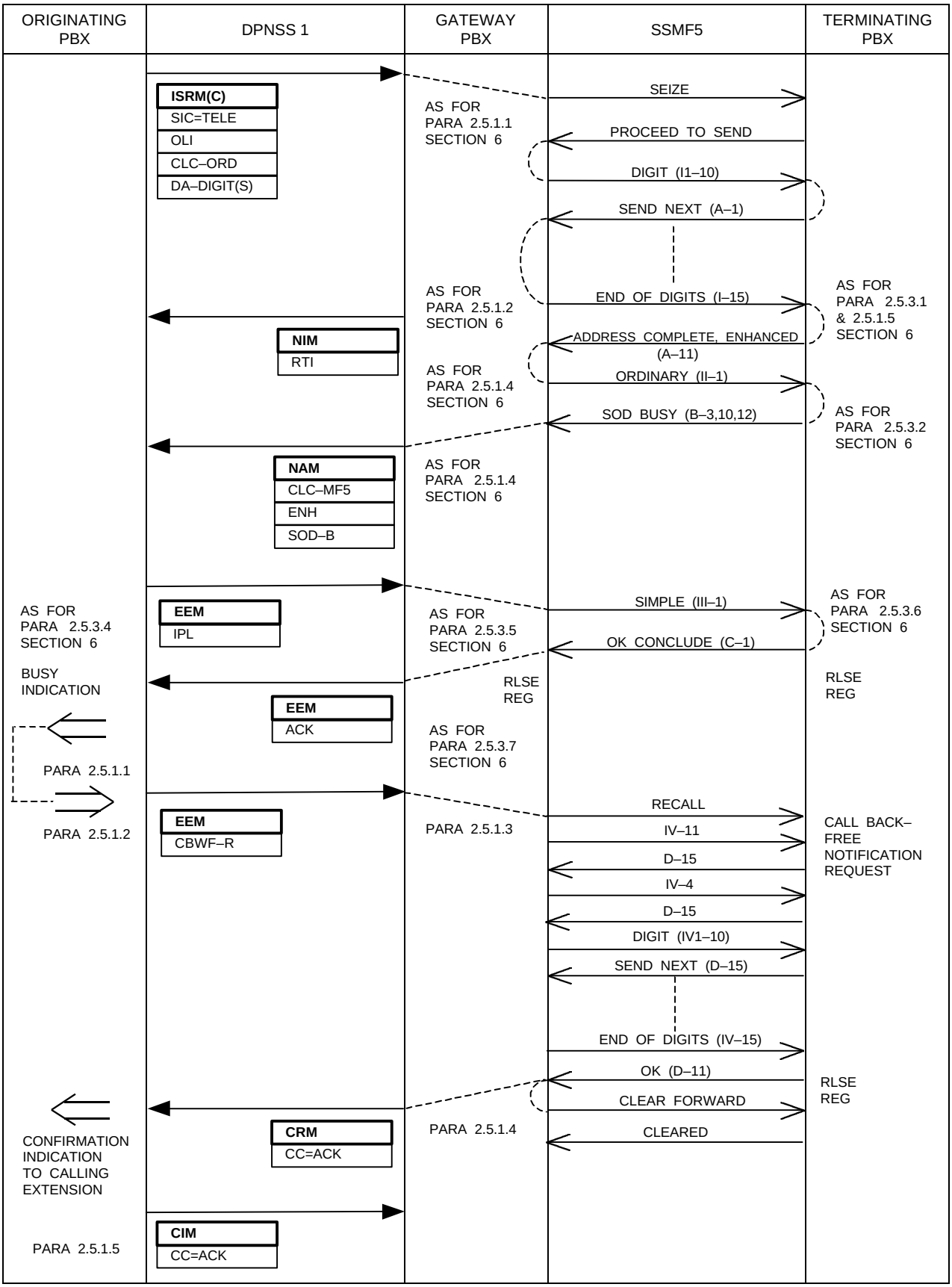
2.5.7 Call Back When Free - Reverted Call Back from SSMF5 to DPNSS 1

2.5.8 Call Back When Free - Cancel Request from SSMF5 to DPNSS 1

2.5.9 Call Back When Free - Request from SSMF5 to DPNSS 1

2.5.10 Call Back When Free - Call Back from DPNSS 1 to SSMF5

2.5.1 CALL BACK WHEN FREE–REQUEST FROM DPNSS 1 TO SSMF5



2.5.1.1 On receipt of an EEM containing ACK after a NAM containing SOD-B the calling party is given busy indication.

2.5.1.2 A Call Back When Free Request (CBWF-R) follows an unsuccessful call attempt. The period following an unsuccessful call attempt during which a CBWF request can be made is dependent upon the design of the PBX.

The CBWF request is validated by the PBX against the requesting extension's class of service and state (eg is the requesting extension allowed CBWF, etc). If the request is allowed an EEM is sent containing CBWF-R.

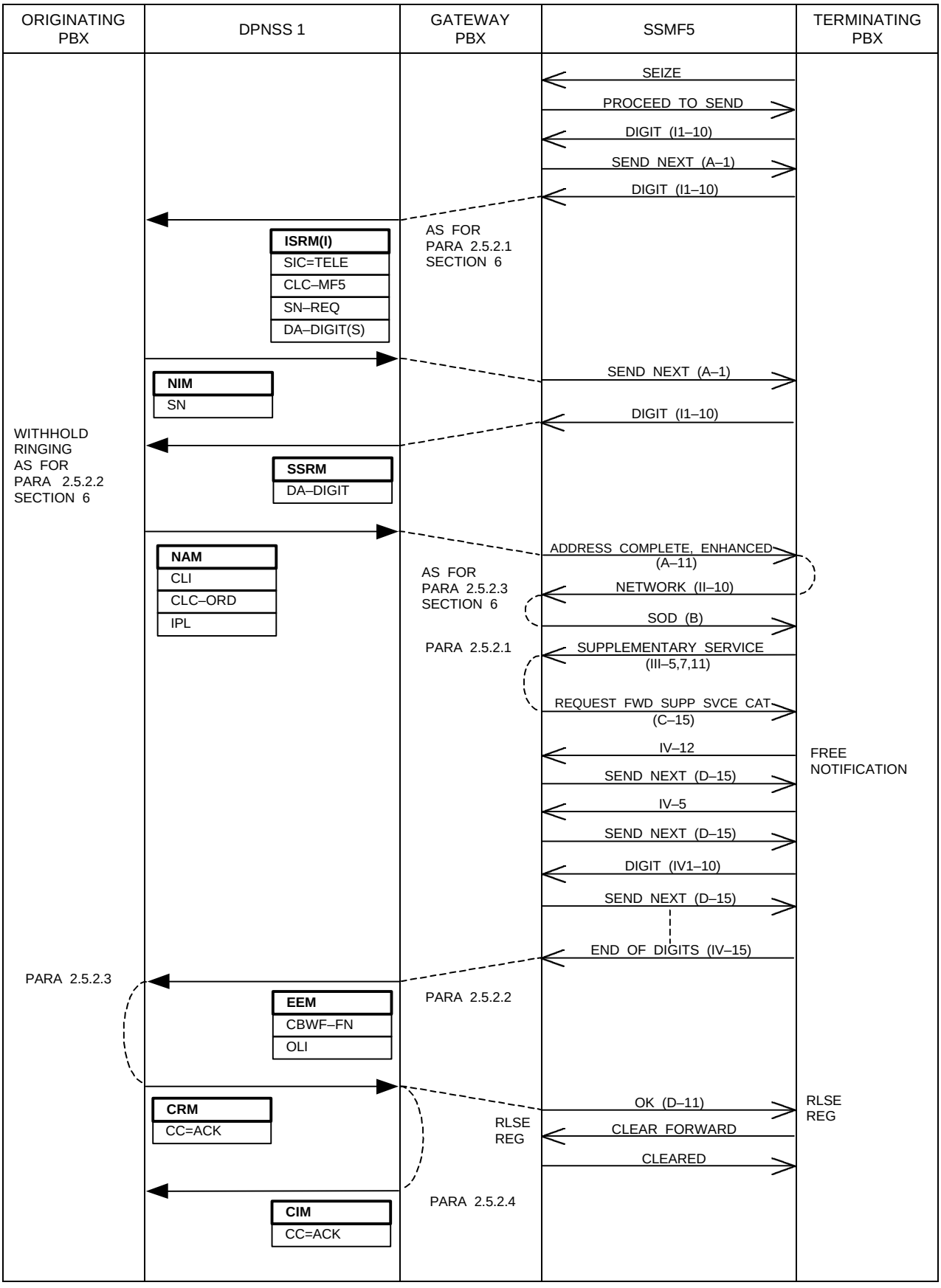
2.5.1.3 On receipt of the EEM containing CBWF-R the Gateway PBX allocates a register and sends a Recall Line Signal to the Terminating PBX. Following the Recall Line Signal the SSMF5 signalling for the Free Notification Request detailed in accordance with the relevant specification is applicable (ie SSMF5 Signals IV-11 + IV-4 followed by calling party address).

2.5.1.4 If the service is accepted and an SSMF5 OK-Conclude (D-11) signal is received the Gateway PBX clears the SSMF5 link and sends a CRM containing Clearing Cause: ACK to the Originating PBX. A CIM is expected in response.

If an SSMF5 signal D-12 is received during the transfer of SSMF5 information the Gateway PBX sends a CRM containing Clearing Cause: SU to the Originating PBX and clears the SSMF5 link.

2.5.1.5 The action taken on receipt of a CRM is the same as that in DPNSS[188] SECTION 9 Paragraph 2.3.1.3 except that the CRM does not contain CLI or SOD. The CLI shall be taken as being the same as the Destination Address that was sent in the ISRM and the SOD shall be taken as being Busy.

2.5.2 CALL BACK WHEN FREE – FREE NOTIFICATION FROM SSMF5 TO DPNSS 1



2.5.2.1 Receipt of the SSMF5 Network (II-10) Signal indicates that a Supplementary Service may follow. The Gateway PBX returns the SOD of the called party and awaits the SSMF5 Supplementary Service Request.

2.5.2.2 On receipt of the SSMF5 End of Digits signal the Gateway PBX sends an EEM indicating that the requested party is now free (CBWF-FN) and the identity of that party (OLI).

If the requesting party was busy on receipt of the ISRM then the Gateway PBX will have received a CRM containing the Clearing Cause: BY instead of a NAM. In this case when the SSMF5 End of Digits signal is received the Gateway PBX will send an ISRM on a Virtual Channel to the Originating PBX. The ISRM will contain an SIC, CLC-MF5, OLI, CBWF-FN and the Destination Address.

If a CRM containing the Clearing Cause: ACK is received the Gateway PBX will send the SSMF5 signal D-11. If any other Clearing Cause is received in the CRM the Gateway PBX will send the SSMF5 signal D-12.

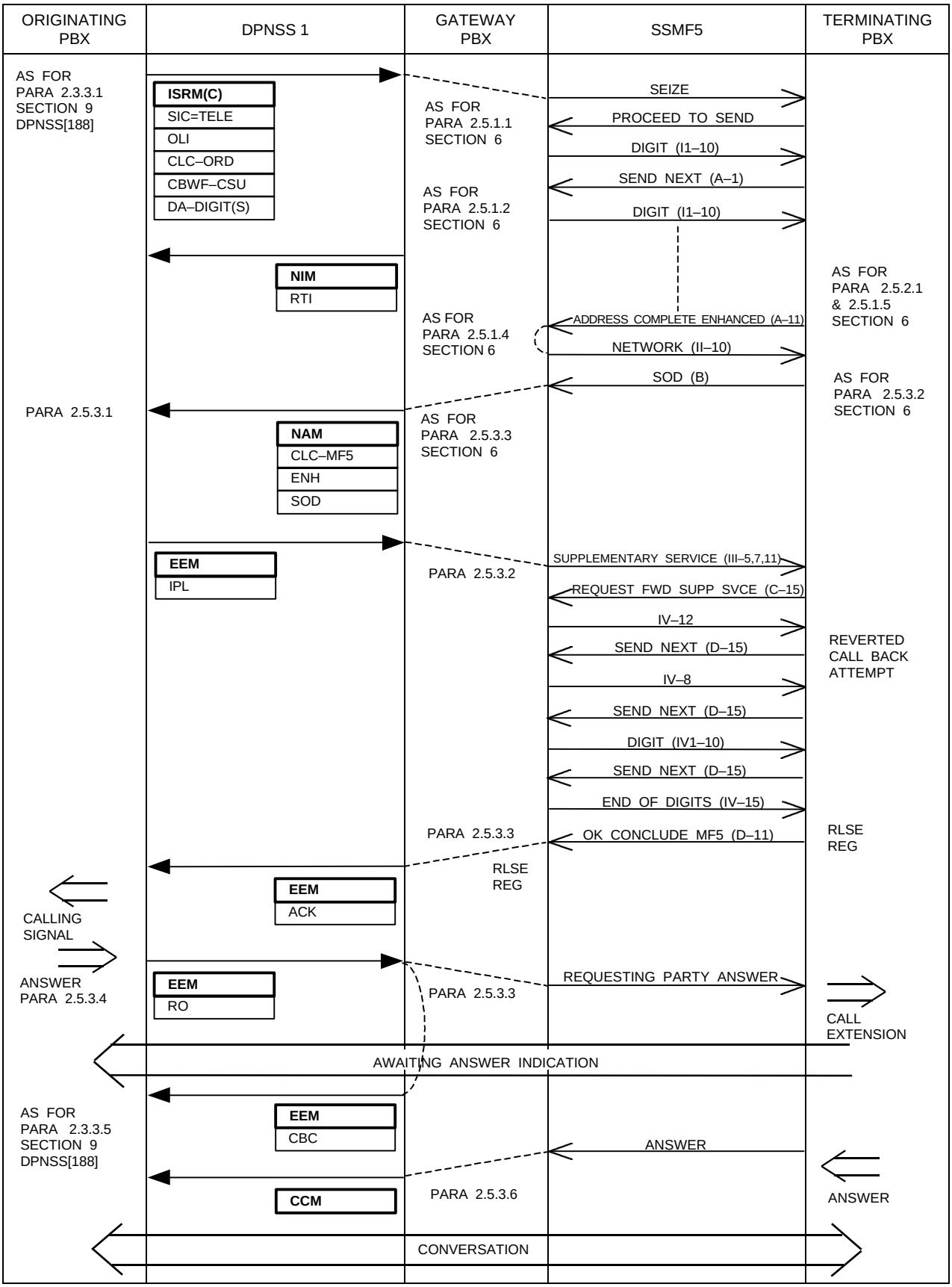
A CIM will be sent in response to the CRM.

2.5.2.3 On receipt of the Free Notification the Originating PBX acknowledges the transfer of the control function, and releases the call with a Clear Request Message containing Clearing Cause: ACK. If the requesting extension is free the Originating PBX initiates a Call Set-Up. If the requesting extension is busy, setting up of the call is delayed until it becomes free.

When the Free Notification is received and the requesting extension is free, the Originating PBX starts a timeout to cover the CBWF Call Set Up; during this timeout, service will be withheld from the requesting extension to give priority to the CBWF Call Set Up.

2.5.2.4 On receipt of a CRM containing Clearing Cause: ACK the Gateway PBX sends an OK-Conclude (D-11) signal on the SSMF5 link, and returns a CIM to the Originating PBX. If any other Clearing Cause is received in the CRM the Gateway PBX will send the SSMF5 signal D-12.

2.5.3 CALL BACK WHEN FREE–CALL SET UP FROM DPNSS 1 TO SSMF5



2.5.3.1 If the NAM contains SOD-F the Originating PBX sends an EEM containing the Intrusion Protection Level (IPL) of the requesting party.

The action to be taken on receipt of a NAM containing SOD-B is dependent upon the way in which the SSMF5 part of the network functions and must be decided on a network basis. Possible actions are:

i. The Originating PBX releases the call and remakes the CBWF-CSU call after a timeout.

ii. The Originating PBX sends an EEM containing an IPL causing the Gateway to continue with the Reverted Call Back Attempt. The Terminating SSMF5 PBX interprets the Returned Flip Flop Call Back signals (IV-12 + IV-8) as a Free Notification Request.

2.5.3.2 When an EEM containing the calling parties IPL is received, an SSMF5 Supplementary Service Request Signal (III-5, 7 or 11) is sent followed by a two signal message: Returned Flip Flop Call Back (IV-12 + IV-8) and the complete address of the calling party.

2.5.3.3 On receipt of the SSMF5 signal OK-Conclude (D-11) an EEM containing ACK is sent to the Originating PBX.

If an SSMF5 call failure Signal (D-12) is received at any point during the transfer of information, a CRM is sent containing Clearing Cause: SU.

2.5.3.4 As for DPNSS[188] SECTION 9 Paragraph 2.3.3.3 except that the action is on receipt of an EEM containing ACK rather than a NAM.

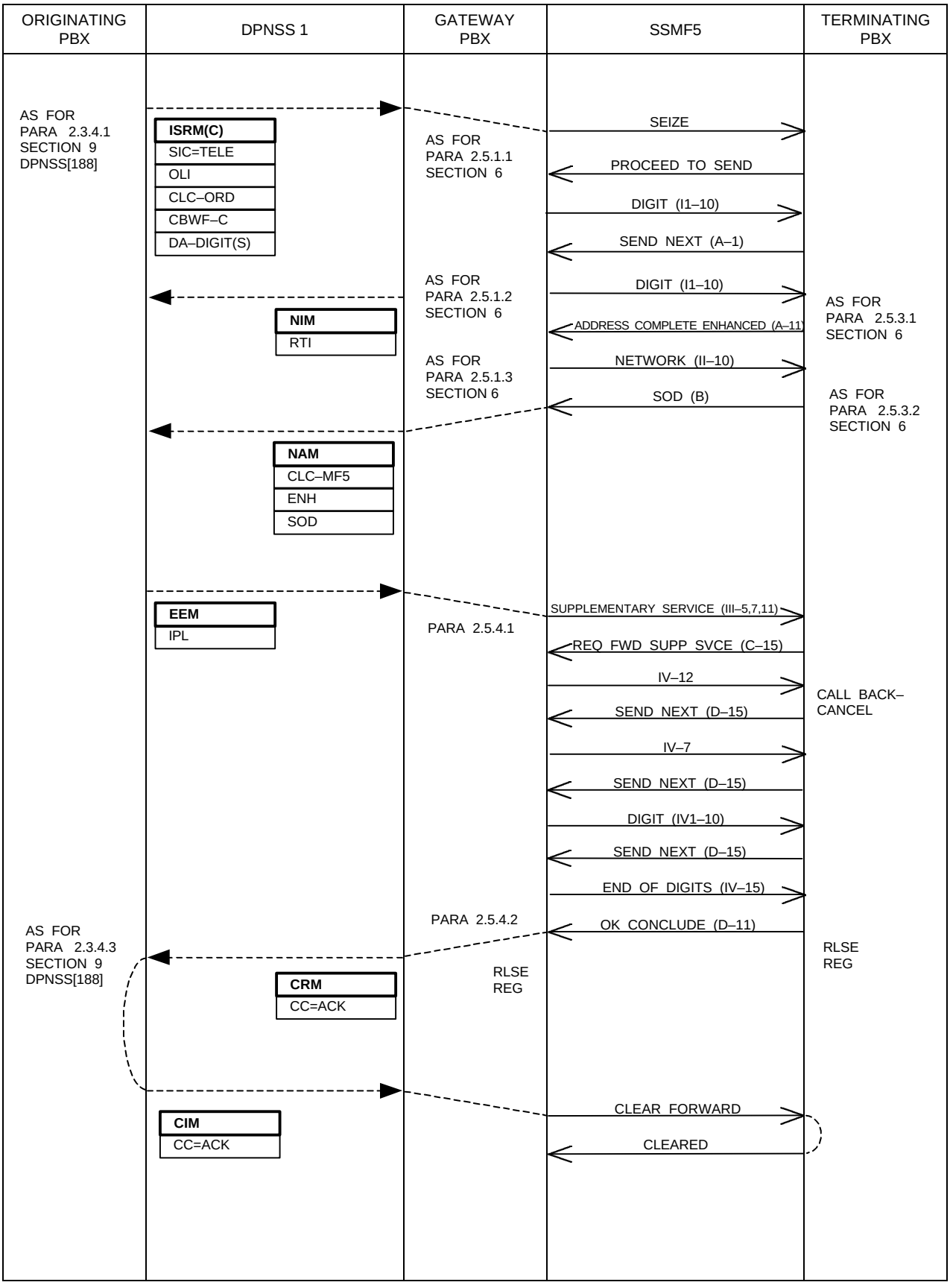
2.5.3.5 On receipt of the EEM containing RO a Requesting Party Answer Line Signal is sent to the Terminating PBX.

If a CRM containing the Clearing Cause: REJ is received the SSMF5 link is cleared and a CIM sent in response.

2.5.3.6 When the Requesting Party Answer Line Signal is sent an EEM containing CBC is returned to the Originating PBX.

NOTE: This is because in SSMF5 the called party is guarded from incoming and outgoing calls and the extension must therefore still be free.

2.5.4 CALL BACK WHEN FREE–CANCEL REQUEST FROM DPNSS 1 TO SSMF5

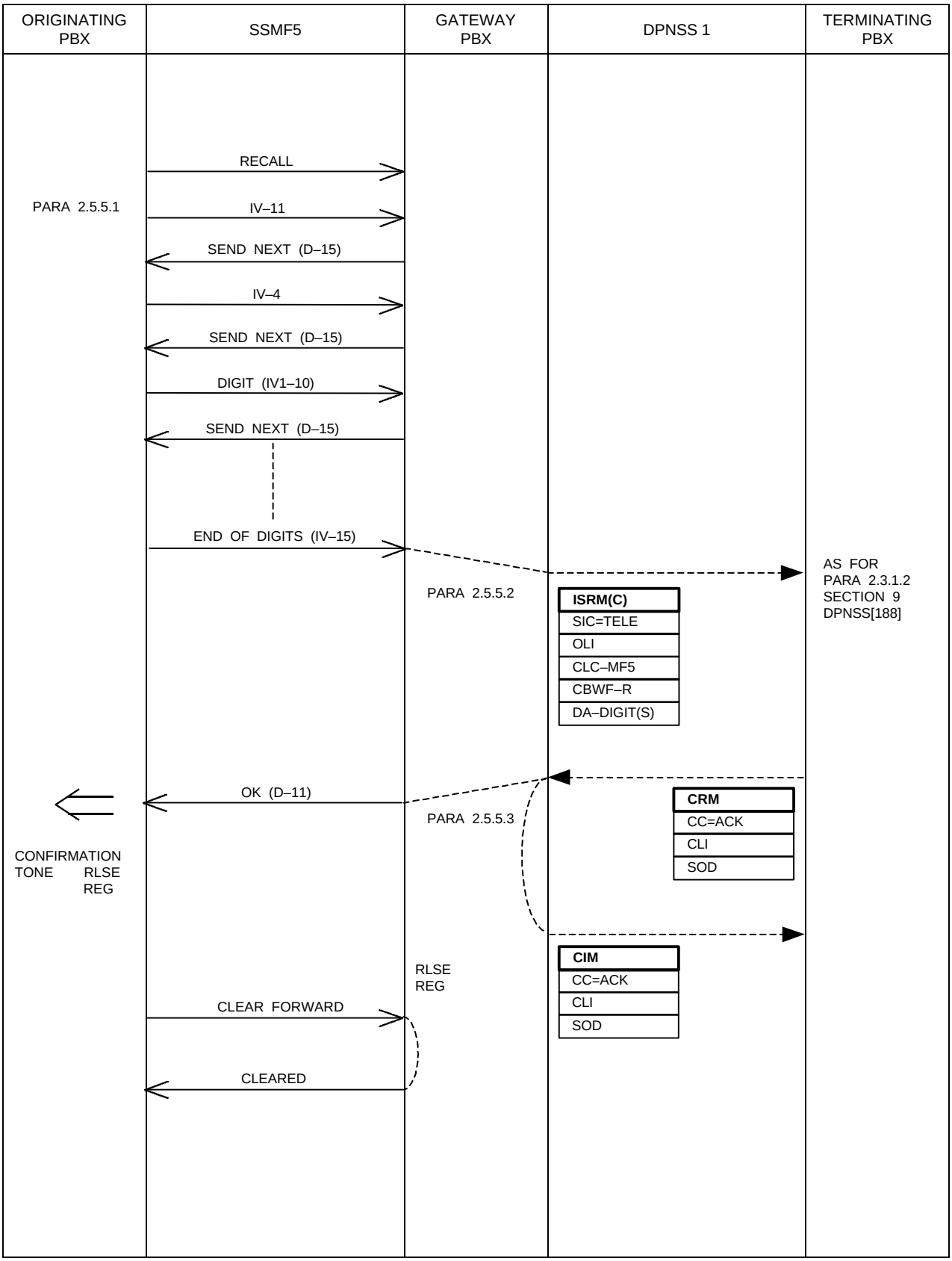


2.5.4.1 When the EEM containing the calling parties IPL is received an SSMF5 Supplementary Service Request Signal (III-5, 7 or 11) is sent followed by a Cancel Call Back (IV-12 + IV-7) and the complete address of the calling party.

2.5.4.2 On receipt of the SSMF5 signal OK Conclude (D-11) the Gateway PBX sends a CRM containing Clearing Cause: ACK and expects a CIM in response.

If an SSMF5 Request Rejected Signal (D-12) was received a CRM containing the Clearing Cause: SU is sent and a CIM expected in response.

2.5.5 CALL BACK WHEN FREE–FREE NOTIFICATION REQUEST FROM SSMF5 TO DPNSS 1



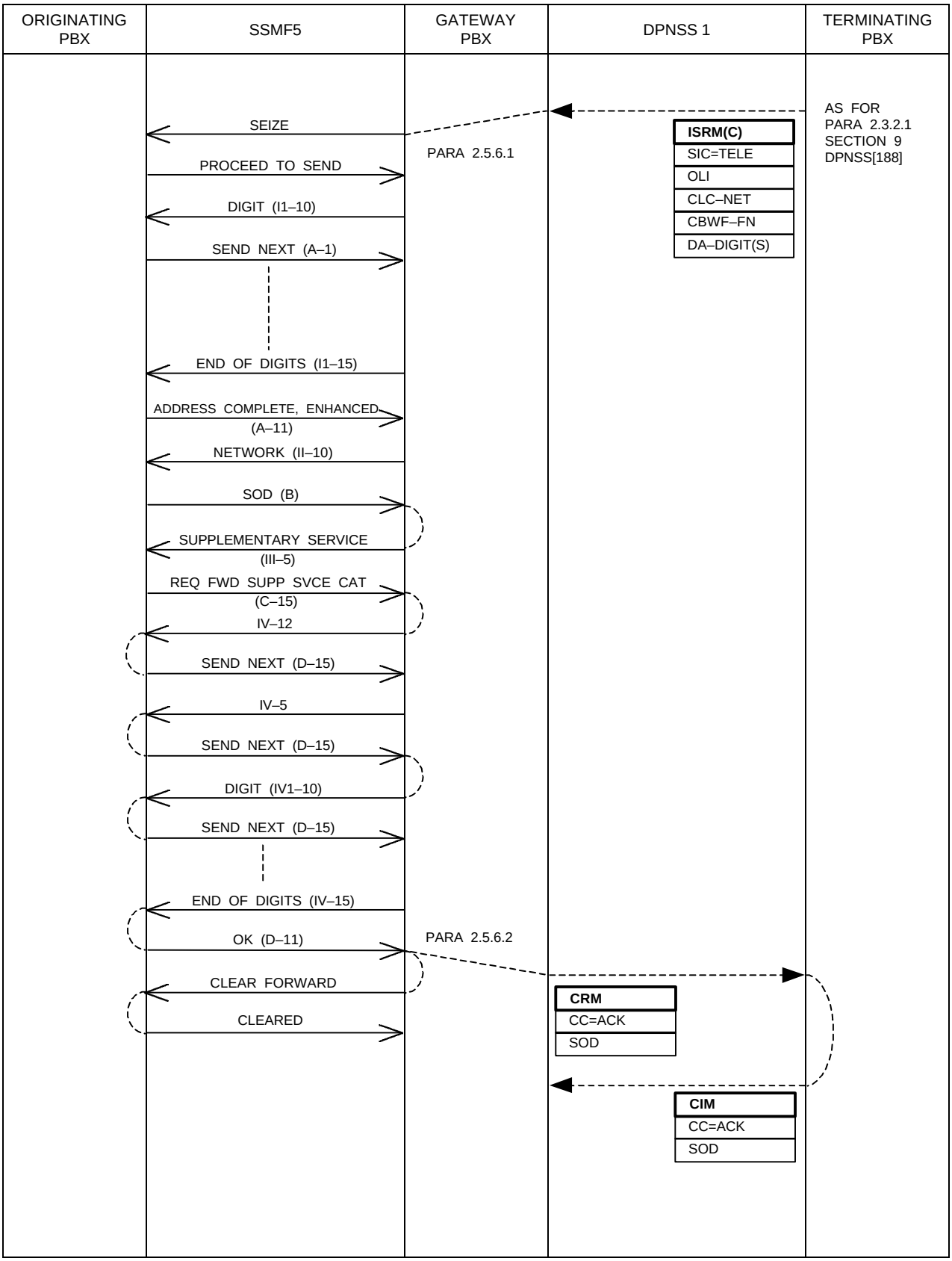
2.5.5.1 Following a Simple Call meeting Busy, the calling party request for a Call Back When Free causes the Originating PBX to send a Register Recall Signal, followed by the SSMF5 two signal message, Free Notification Request and the calling party address as detailed in accordance with the relevant specification.

2.5.5.2 When the Gateway PBX receives the SSMF5 End of Digits Signal, after a Free Notification Request and after a Simple Call had encountered Busy, it sends an ISRM containing the OLI, CBWF-R and CLC-MF5 on a Virtual Channel.

2.5.5.3 When the Gateway PBX receives a CRM containing Clearing Cause: ACK it sends an OK-Conclude SSMF5 signal (D-11) to the Originating PBX returns a CIM to the Terminating PBX and releases the switch path. The CLI and SOD strings contained in the CRM are discarded by the Gateway.

If the Gateway PBX receives a CRM with a Clearing Cause other than ACK it sends an SSMF5 Reject Signal (D-12) to the Originating PBX.

2.5.6 CALL BACK WHEN FREE – FREE NOTIFICATION FROM DPNSS 1 TO SSMF5

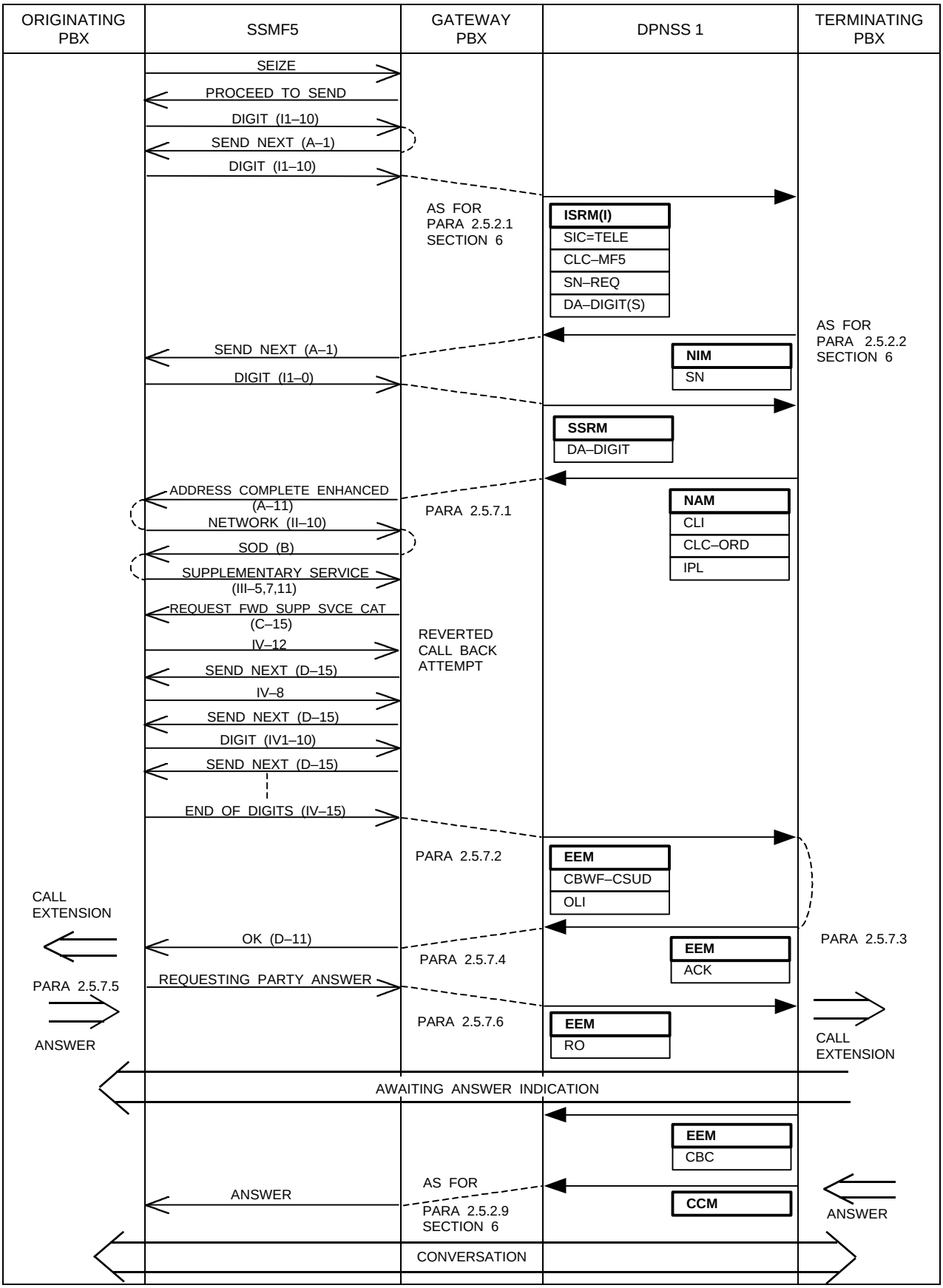


2.5.6.1 When the Gateway PBX receives an ISRM containing CBWF-FN it sets up a call to the SSMF5 line as detailed in accordance with the relevant specification.

2.5.6.2 On receipt of the SSMF5 Group D Signal: OK (D 11) the Gateway PBX, depending upon the earlier SSMF5 Group B Signal, sends a CRM containing Clearing Cause: ACK and SOD-F or SOD-B to indicate that the call has reached its destination PBX and whether the requesting party is busy or free. If any other Group B Signal is received it shall be mapped to an appropriate Clearing Cause (as shown in SECTION 6 Paragraph 2.5.1.6).

If the SSMF5 signal D-12 is received by the Gateway PBX at any time, it shall send a CRM to the Terminating PBX containing the Clearing Cause: FNR and expect a CIM in response. The SSMF5 route shall also be cleared.

2.5.7 CALL BACK WHEN FREE – REVERTED CALL BACK FROM SSMF5 TO DPNSS 1



2.5.7.1 If a NAM is received the Gateway behaves as specified in SECTION 6 Paragraph 2.5.2.3.

If a CRM is received the Gateway will return a CIM but continue SSMF5 signalling until the receipt of an SSMF5 Group III signal; it will then send an SSMF5 signal C-4 and release the SSMF5 call. The action of the SSMF5 Originating PBX is dependent upon the way in which the SSMF5 part of the network functions, possible actions include:

i. Remake the Returned Flip Flop Call Back after a time out.

ii. Cancel the Call back Request.

2.5.7.2 On receipt of the SSMF5 End of Digits signal the Gateway PBX sends an EEM containing CBWF-CSUD and OLI.

2.5.7.3 On receipt of the EEM containing CBWF-CSUD, the Terminating PBX validates the Call Back Call. If validation is successful it returns an EEM containing ACK and continues to block the extension. If unsuccessful a CRM containing Clearing Cause: FNR is returned and a CIM is expected in response.

2.5.7.4 On receipt of the EEM containing ACK the Gateway PBX sends an OK Conclude SSMF5 signal (D-11). If a CRM containing Clearing Cause: FNR is received the Gateway returns a CIM and sends a Request not Accepted SSMF5 Signal (D-12). If the Gateway does not receive a Requesting Party Answer within 8-16 Seconds the request is cancelled by sending a CRM containing Clearing Cause: REJ. The request is cancelled locally by the Originating SSMF5 PBX.

2.5.7.5 When the requesting party answers, the Originating PBX sends a Requesting Party Answer Line Signal to the Gateway PBX.

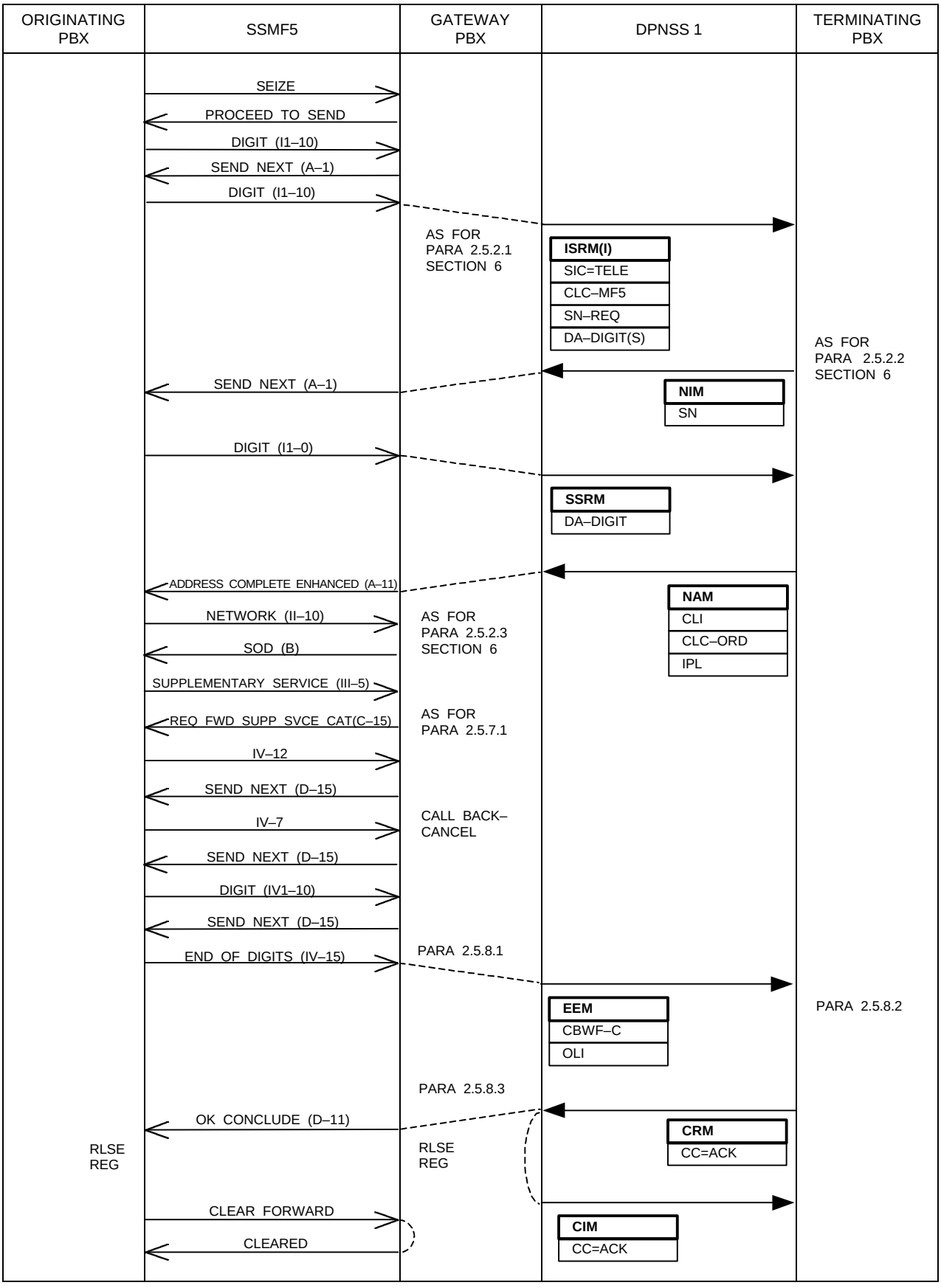
2.5.7.6 When the Requesting Party Answer Line Signal is received by the Gateway PBX it sends an EEM containing RO to the Terminating PBX.

2.5.7.7 Calling signal is sent to the wanted extension and Awaiting Answer Indication is returned in the traffic channel. An EEM containing CBC is then sent and the Call Back record cleared.

2.5.7.8 The EEM containing CBC is discarded by the Gateway PBX.

2.5.7.9 If a Clear Forward Signal is received the Gateway PBX sends CRM containing Clearing Cause: REJ and String CBWF-C and expects a CIM in response.

2.5.8 CALL BACK WHEN FREE–CANCEL REQUEST FROM SSMF5 TO DPNSS 1



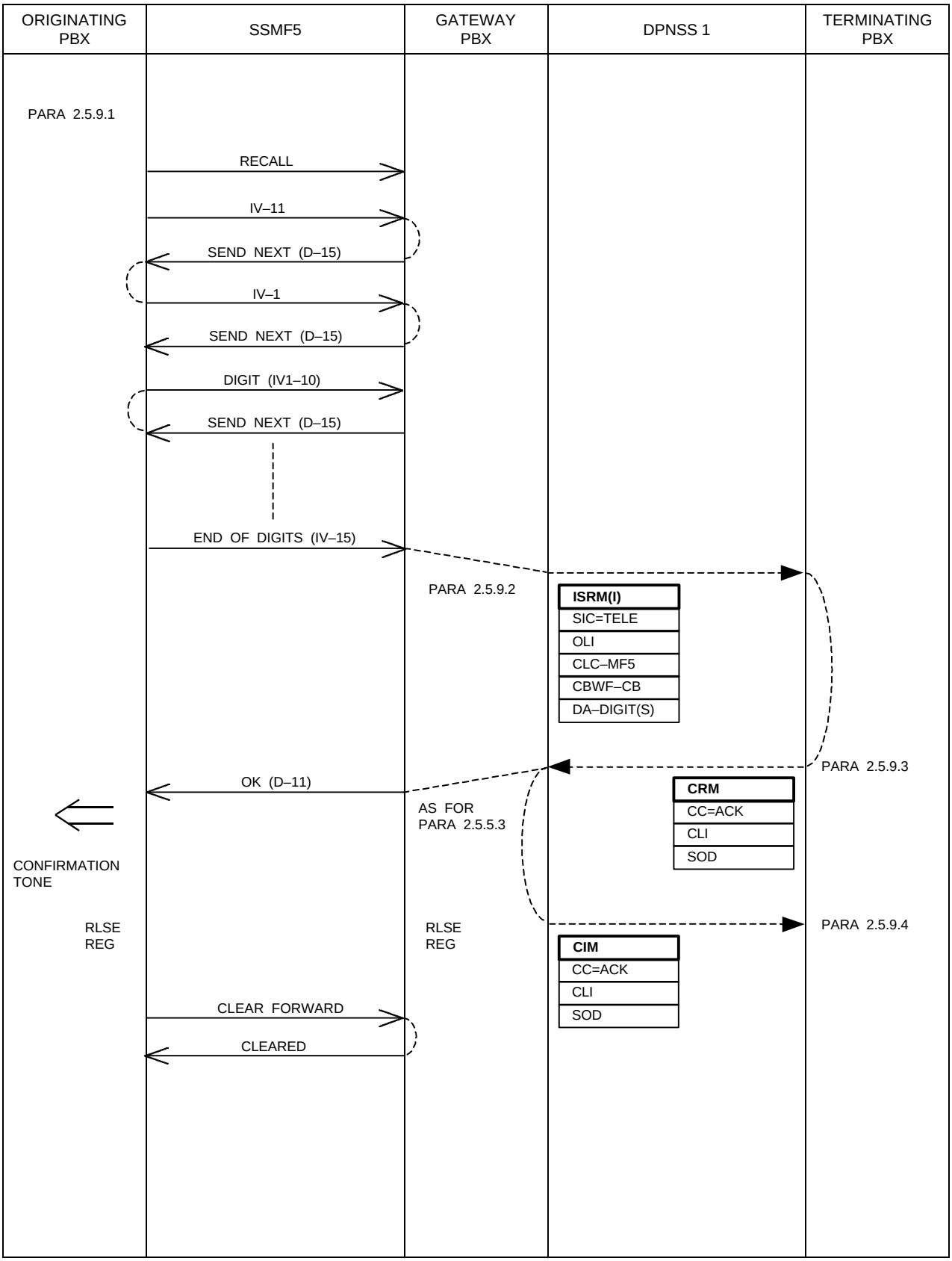
2.5.8.1 On receipt of the SSMF5 End of Digits Signal, having previously received the SSMF5 two signal message indicating Cancel Call Back, an EEM containing CBWF-C and the OLI is sent to the Terminating PBX.

2.5.8.2 On receipt of the EEM containing CBWF-C, the cancel request is validated against the called party and the OLI. If the request is accepted a CRM containing Clearing Cause: ACK is returned. If the request is not accepted a CRM containing Clearing Cause: FNR is returned. A CIM is expected in response to the CRM.

2.5.8.3 If a CRM containing Clearing Cause: ACK is received a CIM is sent in response and an SSMF5 OK-Conclude (D-11) signal is sent to the Originating PBX. The SSMF5 register is released.

If a CRM containing Clearing Cause: FNR is received a CIM is sent in response and an SSMF5 Request Rejected Signal (D-12) sent to the Originating PBX.

2.5.9 CALL BACK WHEN FREE REQUEST FROM SSMF5 TO DPNSS 1



2.5.9.1 Following a Simple Call meeting Busy, if the calling party requests Call Back, the Originating PBX sends a Register Recall signal followed by the SSMF5 two signal message Request Call Back and the calling party address as detailed in accordance with the relevant specification.

2.5.9.2 When the SSMF5 End of Digits signal is received the Gateway PBX makes a Virtual Call by sending an ISRM containing SIC=TELE, CLC-MF5, OLI, CBWF-CB and the Destination Address.

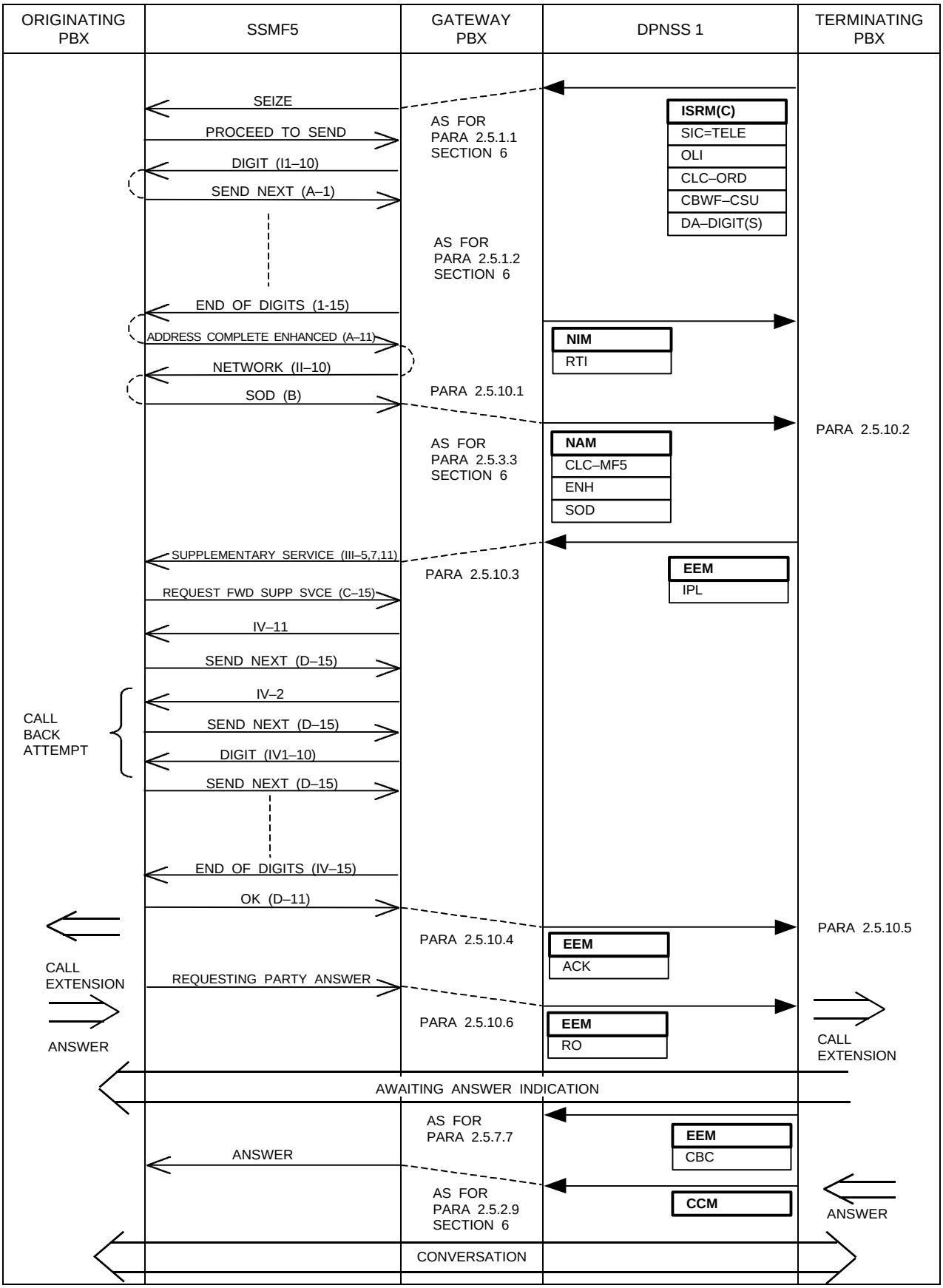
2.5.9.3 On receipt of the ISRM the Terminating PBX validates the Call Back Request.

If the request is accepted the Terminating PBX sends a CRM containing Clearing Cause: ACK the CLI and the SOD of the requested extension.

If the request is not accepted the Terminating PBX sends a CRM containing Clearing Cause: SU.

2.5.9.4 When the requested extension becomes free the Terminating PBX initiates the Call Back When Free Attempt sequence shown in Paragraph 2.5.10.

2.5.10 CALL BACK WHEN FREE CALL BACK FROM DPNSS 1 TO SSMF5



2.5.10.1 As the Call Back When Free-Call Back Attempt call is indicated in the ISRM, the Gateway PBX sends the SSMF5 Signal: Network (II-10).

2.5.10.2 If the NAM contains SOD-F then the Terminating PBX sends an EEM containing the Intrusion Protection Level (IPL) of the required party.

The action to be taken on receipt of a NAM containing SOD-B is dependent upon the way in which the SSMF5 part of the network functions and must be decided on a network basis, Possible actions are:

i. The Terminating PBX releases the call and remakes the CBWF-CLB call after a timeout.

ii. The Terminating PBX sends an EEM containing an IPL causing the Gateway to continue with the Call Back Attempt. The Originating SSMF5 PBX interprets the IV-11 + IV-2 signals as a Call Back When Free Request.

2.5.10.3 On receipt of the EEM containing IPL the Gateway PBX sends an SSMF5 Group III signal indicating that a Supplementary Service is to follow.

2.5.10.4 When Signalling on the SSMF5 link is completed and the Gateway PBX receives the OK-Conclude SSMF5 signal D-11, it sends an EEM containing ACK to the Terminating PBX.

If the SSMF5 signal D-12 is received by the Gateway PBX at any time, it shall send a CRM to the Terminating PBX containing the Clearing Cause: FNR and expect a CIM in response. The SSMF5 route shall also be cleared.

2.5.10.5 On receipt of the EEM containing ACK the Terminating PBX awaits the EEM containing RO before applying Calling signal to the called extension.

If a CRM containing the Clearing Cause: FNR is received the CBWF records are deleted.

2.5.10.6 On receipt of the Line Signal Requesting Party Answer, the Gateway PBX sends an EEM containing RO which will cause the called terminal to be called.

2.6 INTERWORKING WITH SSMF5 (SSMF5 Call Back Supplementary Service not Supported)

Call Back When Free is an optional Supplementary Service in SSMF5. This paragraph details the requirements for interworking between DPNSS 1 and SSMF5 when the Gateway PBX supports SSMF5 but not the SSMF5 Call Back Supplementary Service.

2.6.1 A DPNSS 1 extension involved in a call to a busy SSMF5 Basic subscriber will have a Call Back When Free Request rejected by the Originating PBX.

2.6.2 If a PBX acting as a Gateway to SSMF5 receives an ISRM containing CBWF-R, CBWF-C, CBWF-FN CBWF-CSUD or CBWF-CSUI then the call should be rejected by sending a CRM containing Clearing Cause: Signalling System Incompatible (SSI) and optionally CLC-MF5. A CIM will be expected in response.

2.6.3 If a PBX acting as a Gateway to SSMF5 receives an EEM containing CBWF-R then the request should be rejected by sending a CRM containing the Clearing Cause: Service Unavailable (SU).

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 10 - SUPPLEMENTARY SERVICE : EXECUTIVE INTRUSION

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HISTORY

Issue 1 - May 1985
Issue 2 - March 1988

Issue 3 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Executive Intrusion Supplementary Service.

1.2 Subsection 2 details the Executive Intrusion Supplementary Service when DPNSS 1 interworks with other signalling systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide the Executive Intrusion Supplementary Service, there is no special PSTN signalling involved.

However, a PSTN Gateway may participate in the Supplementary Service as follows:

2.1.1 If an Executive Intrusion Request (an ISRM containing EI-R or EI-PVR) is received by an extension which is engaged on a call to the PSTN the PBX must determine whether the intrusion is allowed.

If the wanted extension's PBX is also the Gateway PBX the decision to allow intrusion is based on the wanted extension's IPL and the IPL allocated to the PSTN trunk. The request then proceeds as detailed in DPNSS[188] SECTION 10, Paragraphs 2.3.1.4 to 2.3.1.6 (for EI-R) or 2.3.2.4 to 2.3.2.8 (for EI-PVR).

2.1.2 If a Gateway PBX to the PSTN receives an IPL Request (an EEM containing IPL-R) it shall proceed as detailed in DPNSS[188] SECTION 10 Paragraph 2.3.1.3.

2.1.3 A DPNSS 1 extension involved in a call to a PSTN customer (eg receiving busy tone) will have an Executive Intrusion Request rejected by the Originating PBX.

2.1.4 If a Gateway PBX to the PSTN receives an Executive Intrusion Request (an ISRM containing either, EI-R or, EI-PVR) it may allow the call to proceed as a Simple Call to the PSTN or, alternatively, it may bar access.

If the call is allowed to proceed it follows the procedures shown in SECTION 6 Paragraph 2.1.1.

If the call is not allowed to proceed and there is no other suitable route the call is rejected with a CRM containing the Clearing Cause: Signalling System Incompatible (SSI) and, optionally, CLC-PSTN. A CIM is expected in response.

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide the Executive Intrusion Supplementary Service, there is no special DASS 2 signalling involved.

However, a DASS 2 Gateway may participate in the Supplementary Service as follows:

2.2.1 If an Executive Intrusion Request (an ISRM containing EI-R or EI-PVR) is received by an extension which is engaged on a call to DASS 2 the PBX must determine whether the intrusion is allowed.

If the wanted extension's PBX is also the Gateway PBX the decision to allow intrusion is based on the wanted extension's IPL and the IPL allocated to the DASS 2 route. The request then proceeds as detailed in DPNSS[188] SECTION 10, Paragraphs 2.3.1.4 to 2.3.1.6 (for EI-R) or 2.3.2.4 to 2.3.2.8 (for EI-PVR).

2.2.2 If a Gateway PBX to DASS 2 receives an IPL request (an EEM containing IPL-R) it shall proceed as detailed in DPNSS[188] SECTION 10 Paragraph 2.3.1.3.

2.2.3 A DPNSS 1 extension involved in a call to a busy DASS 2 subscriber will have an Executive Intrusion Request rejected by the Originating PBX.

2.2.4 If a Gateway PBX to DASS 2 receives an Executive Intrusion Request (an ISRM containing either, EI-R or, EI-PVR) it may allow the call to proceed as a Simple Call to DASS 2 or, alternatively, it may bar access.

If the call is allowed to proceed it follows the procedures shown in SECTION 6 Paragraph 2.2.1.

If the call is not allowed to proceed and there is no other suitable route the call is rejected with a CRM containing the Clearing Cause: Signalling System Incompatible (SSI) and, optionally, CLC-ISDN. A CIM is expected in response.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED.

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

As a Decadic route does not provide the Executive Intrusion Supplementary Service, there is no special Decadic signalling involved.

However, a Decadic Gateway may participate in the Supplementary Service as follows:

2.4.1 If an Executive Intrusion Request (an ISRM containing EI-R or EI-PVR) is received by an extension which is engaged on a call to a Decadic route the PBX must determine whether the intrusion is allowed.

If the wanted extension's PBX is also the Gateway PBX the decision to allow intrusion is based on the wanted extension's IPL and the IPL allocated to the Decadic route. The request then proceeds as detailed in DPNSS[188] SECTION 10, Paragraphs 2.3.1.4 to 2.3.1.6 (for EI-R) or 2.3.2.4 to 2.3.2.8 (for EI-PVR).

2.4.2 If a Gateway PBX to a Decadic route receives an IPL Request (an EEM containing IPL-R) it shall proceed as detailed in DPNSS[188] SECTION 10, Paragraph 2.3.1.3.

2.4.3 A DPNSS 1 extension involved in a call to a Decadic extension (eg receiving busy tone) will have an Executive Intrusion Request rejected by the Originating PBX.

2.4.4 If a Gateway PBX to a Decadic route receives an Executive Intrusion Request (an ISRM containing either, EI-R or, EI-PVR) it may allow the call to proceed as a Simple Call to the Decadic route or, alternatively, it may bar access.

If the call is allowed to proceed it follows the procedures shown in SECTION 6 Paragraph 2.4.1.

If the call is not allowed to proceed and there is no other suitable route the call is rejected with a CRM containing the Clearing Cause: SSI and, optionally, CLC-DEC. A CIM is expected in response.

2.5 INTERWORKING WITH SSMF5

As an SSMF5 route does not provide the Executive Intrusion Supplementary Service, there is no special SSMF5 signalling involved.

However, an SSMF5 Gateway may participate in the Supplementary Service as follows:

2.5.1 If an Executive Intrusion Request (an ISRM containing EI-R or EI-PVR) is received by an extension, which is engaged on a call to an SSMF5 route, the PBX must determine whether the intrusion is allowed.

If the wanted extension's PBX is also the Gateway PBX the decision to allow intrusion is based on the wanted extension's IPL and the IPL indicated on the SSMF5 route. The request then proceeds as detailed in DPNSS[188] SECTION 10, Paragraphs 2.3.1.4 to 2.3.1.6 (for EI-R) or 2.3.2.4 to 2.3.2.8 (for EI-PVR).

2.5.2 If a Gateway PBX to an SSMF5 route receives an IPL Request (an EEM containing IPL-R) it shall proceed as detailed in DPNSS[188] SECTION 10, Paragraph 2.3.1.3.

2.5.3 A DPNSS 1 extension involved in a call to a busy SSMF5 subscriber will have an Executive Intrusion Request rejected by the Originating PBX.

2.5.4 If a Gateway PBX to an SSMF5 route receives an Executive Intrusion Request (an ISRM containing either, EI-R or, EI-PVR) it may allow the call to proceed as a Simple Call to the SSMF5 route or, alternatively, it may bar access.

If the call is allowed to proceed it follows the procedures shown in SECTION 6 Paragraph 2.5.1.

If the call is not allowed to proceed and there is no other suitable route the call is rejected with a CRM containing the Clearing Cause: Signalling System Incompatible (SSI) and, optionally, CLC-MF5. A CIM is expected in response.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 11 - SUPPLEMENTARY SERVICE : DIVERSION

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HISTORY

Issue 1 - May 1985
Issue 2 - March 1988

Issue 3 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7
BTNR 190 Issue 2

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Diversion Supplementary Service.

1.2 Subsection 2 details the Diversion Supplementary Service when DPNSS 1 interworks with other signalling systems. In general the description is given in the form of explanatory text but, in the case of SSMF5, Message Sequence Diagrams (MSDs) are also included.

1.3 Alternative action (eg for unsuccessful calls) not shown in MSDs is given in accompanying text. The text is referred to in the MSDs at appropriate points in the sequences.

1.4 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide the Diversion Supplementary Service there is no special PSTN signalling involved.

However, a PSTN Gateway PBX may participate in the service as follows:

2.1.1 If a PBX, acting as a Gateway to the PSTN, receives a Diverting Call (an ISRM or RM containing DVG-I, DVG-B or DVG-R) it may allow the call to proceed as a Simple Call to the PSTN or, alternatively, it may bar access to the PSTN.

If the call is not allowed to proceed and there is no other suitable route the call shall be rejected by a CRM or, in the case of Single Channel Working, by an RRM. The CRM or RRM shall contain the Clearing Cause: Signalling System Incompatible (SSI) and, optionally, CLC-PSTN.

If the call is allowed to proceed it shall follow the procedures shown in SECTION 6, Paragraph 2.1.1 of this specification. Single Channel Working may be used where the original call and the diverting call take the same route through the DPNSS 1 network. If the PBX where Branching occurs is also the point where the diverting call enters the PSTN, that PBX shall perform both the Branching and Gateway functions. The behaviour of the Branching/Gateway PBX is equivalent to that of separate Branching and Gateway PBXs communicating over a DPNSS 1 channel. The Branching function shall be in accordance with DPNNS[188] SECTION 11 Paragraph 2.3.6, 2.3.8 or 2.3.10. The Gateway function shall be in accordance with SECTION 6, Paragraph 2.1.1 of this specification.

If the Diversion is on No-Reply the NAM returned by the Gateway PBX will cause the original call to be released either by the Originating PBX or, in the case of Single Channel Working, the Branching PBX although there is no guarantee that the call to the PSTN will succeed. For this reason it may be preferable that Diverting on No-Reply calls are not allowed to proceed to the PSTN.

2.1.2 An incoming call from the PSTN may encounter an extension within the DPNSS 1 network which has Diversion registered. Under these circumstances the Gateway PBX will receive either:

i. a NAM containing DVT-I, DVT-B, DVD-I, DVD-B or DVD-E

or ii. an EEM containing DVT-R, DVD-E or DVD-R.

In either case the procedures of DPNSS[188] SECTION 11 shall apply with the Gateway PBX acting in the same way as an Originating DPNSS 1 PBX. The diverted call shall contain CLC-PSTN and, optionally, an OLI or TID String giving the number of the PSTN trunk.

2.1.3 A Gateway PBX may receive a Diversion Validation Request (an ISRM containing DIV-V). If the request is accepted the procedures of DPNSS[188]SECTION 11 shall apply with the Gateway PBX acting in the same way as a DPNSS 1 Terminating PBX except that CLC-PSTN shall be included in a CRM containing Clearing Cause: ACK. If the request is rejected a CRM containing Clearing Cause: SSI, and optionally, CLC-PSTN shall be sent.

2.1.4 If the Gateway PBX receives either a Diversion Follow-Me Request or a Diversion Cancellation request it shall reject them with a CRM containing Clearing Cause: SSI and, optionally, CLC-PSTN.

2.1.5 If a Gateway PBX receives an ISRM or RM containing a Diversion Bypass Request (DIV-BY), the String shall be ignored and the call shall be processed in accordance with the remainder of the message.

2.1.6 If a call to a PBX acting as a Gateway to the PSTN is Diverted Immediate or On Busy via that signalling system it shall follow the procedures shown in SECTION 6, Paragraph 2.1.1 with the addition that the NAM shall contain the String Diverted Externally (DVD-E) with the Parameter "I", if Diverted Immediate, or "B", if Diverted On Busy.

2.1.7 If a call to a PBX acting as a Gateway to the PSTN is Diverted On No Reply via that signalling system the call shall be established in accordance with the procedures for that signalling system. If the call is set up successfully an EEM containing the String Diverted Externally (DVD-E) with the Parameter "R" shall be sent to the Originating PBX.

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide the Diversion Supplementary Service there is no special DASS 2 signalling involved.

However, a DASS 2 Gateway PBX may participate in the service as follows:

2.2.1 If a PBX, acting as a Gateway to DASS 2, receives a Diverting Call (an ISRM or RM containing DVG-I, DVG-B or DVG-R) it may allow the call to proceed as a Simple Call to DASS 2 or, alternatively, it may bar access to DASS 2.

If the call is not allowed to proceed and there is no other suitable route the call shall be rejected by a CRM or, in the case of Single Channel Working, by an RRM. The CRM or RRM shall contain the Clearing Cause: SSI and, optionally, CLC-ISDN.

If the call is allowed to proceed it shall follow the procedures shown in SECTION 6, Paragraph 2.2.1 of this specification. Single Channel Working may be used where the original call and the diverting call take the same route through the DPNSS 1 network. If the PBX where Branching occurs is also the point where the new call enters DASS 2,that PBX shall perform both the Branching and Gateway functions. The behaviour of the Branching/Gateway PBX is equivalent to that of separate Branching and Gateway PBXs communicating over a DPNSS 1 channel. The Branching function shall be in accordance with DPNSS[188] SECTION 11 Paragraph 2.3.6, 2.3.8 or 2.3.10. The Gateway function shall be in accordance with SECTION 6, Paragraph 2.2.1 of this specification.

If the Diversion is on No-Reply the NAM returned by the Gateway PBX will cause the original call to be released either by the Originating PBX or, in the case of Single Channel Working, the Branching PBX. Under certain circumstances on DASS 2 Category 2 calls the NAM received from DASS 2 may not contain an "End of Call" indication (EOC) even though the call has been unsuccessful (eg PSTN subscriber busy). The Diverting Call will therefore appear to have been successful and the Gateway PBX will return a NAM to the DPNSS 1 network; the original call will therefore be released. For this reason it may be preferable that Diverting on No-Reply Voice calls are not allowed to proceed to DASS 2.

2.2.2 An incoming call from DASS 2 may encounter an extension within the DPNSS 1 network which has registered Diversion. Under these circumstances the Gateway will receive either:

i. a NAM containing DVT-I, DVT-B, DVD-I, DVD-B or DVD-E

or ii. an EEM containing DVT-R, DVD-E or DVD-R.

In either case the procedures of DPNSS[188] SECTION 11 shall apply with the Gateway PBX acting in the same way as an Originating DPNSS 1 PBX. The diverted call shall contain CLC-ISDN and, optionally, an OLI giving the number of the DASS 2 party.

2.2.3 A Gateway PBX may receive a Diversion Validation Request (an ISRM containing DIV-V). If the request is successful the procedures of DPNSS[188] SECTION 11 shall apply with the Gateway PBX acting in the same way as a DPNSS 1 Terminating PBX except that CLC-ISDN shall be included in the CRM containing Clearing Cause: ACK. If the request is rejected a CRM containing Clearing Cause: SSI and, optionally, CLC-ISDN shall be sent.

2.2.4 If the Gateway PBX receives either a Diversion Follow-Me Request or a Diversion Cancellation request it shall reject them with a CRM containing Clearing Cause: SSI and, optionally, CLC-ISDN.

2.2.5 If a Gateway PBX receives an ISRM or RM containing a Diversion Bypass Request (DIV-BY), the String shall be ignored and the call shall be processed in accordance with the remainder of the message.

2.2.6 If a call to a PBX acting as a Gateway to DASS 2 is Diverted Immediate or On Busy via that signalling system it shall follow the procedures shown in SECTION 6, Paragraph 2.2.1 with the addition that if the DASS 2 NAM contains the TLI of the called party, the DPNSS 1 NAM shall contain the String Diverted Immediate (DVD-I) or Diverted On Busy (DVD-B), as appropriate. If the TLI is not received, the NAM shall contain the String Diverted Externally (DVD-E) with the Parameter "I", if Diverted Immediate, or "B", if Diverted On Busy.

2.2.7 If a call to a PBX acting as a Gateway to DASS 2 is Diverted On No Reply via that signalling system the call shall be established in accordance with the procedures shown in BTNR 190. When the DASS 2 NAM is received, an EEM shall be sent to the Originating PBX. If the DASS 2 NAM contains the TLI of the called party, the EEM shall contain the String Diverted On No Reply (DVD-R). If the TLI is not received, the EEM shall contain the String Diverted Externally (DVD-E) with the Parameter "R".

2.3 INTERWORKING VIA DASS 2

NOT ISSUED

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

As a Decadic route does not provide the Diversion Supplementary Service there is no special Decadic signalling involved.

However, a Decadic Gateway PBX may participate in the service as follows:

2.4.1 If a PBX, acting as a Gateway to Decadic, receives a Diverting call (an ISRM or RM containing DVG-I, DVG-B or DVG-R) it may allow the call to proceed as a Simple Call to Decadic, or alternatively it may bar access to Decadic.

If the call is not allowed to proceed and there is no other suitable route the call shall be rejected by a CRM or, in the case of Single Channel Working, by an RRM. The CRM or RRM shall contain the Clearing Cause: SSI and, optionally, CLC-DEC.

If the call is allowed to proceed it shall follow the procedures shown in SECTION 6, Paragraph 2.4.1 of this specification. Single Channel Working may be used where the original call and the diverting call take the same route through the DPNSS 1 network. If the PBX where Branching occurs is also the point where the new call enters Decadic, that PBX shall perform both the Branching and Gateway functions. The behaviour of the Branching/Gateway PBX is equivalent to that of separate Branching and Gateway PBXs communicating over a DPNSS 1 channel. The Branching function shall be in accordance with DPNSS[188] SECTION 11, Paragraph 2.3.6, 2.3.8 or 2.3.10. The Gateway function shall be in accordance with SECTION 6, Paragraph 2.4.1 of this specification.

If the Diversion is On No-Reply the NAM returned by the Gateway PBX will cause the original call to be released either by the Originating PBX or, in the case of Single Channel Working, the Branching PBX although there is no guarantee that the call to Decadic will succeed. For this reason it may be preferable that Diverting on No-Reply calls are not allowed to proceed to Decadic.

2.4.2 An incoming call from Decadic may encounter an extension within the DPNSS 1 network which has registered Diversion. Under these circumstances the Gateway PBX will receive either:

i. a NAM containing DVT-I, DVT-B, DVD-I, DVD-B or DVD-E

or ii. an EEM containing DVT-R, DVD-E or DVD-R.

In either case the procedures of DPNSS[188] SECTION 11 shall apply with the Gateway PBX acting in the same way as an Originating DPNSS 1 PBX. The diverted call shall contain CLC-DEC and, optionally, an OLI or TID String giving the number of the Decadic trunk.

2.4.3 A Gateway PBX may receive a Diversion Validation Request (ISRM containing DIV-V). If the request is successful the procedures of DPNSS[188] SECTION 11 shall apply with the Gateway PBX acting in the same way as a DPNSS 1 Terminating PBX except that CLC-DEC shall be included in the CRM containing the Clearing Cause: ACK. If the request is rejected a CRM containing the Clearing Cause: SSI and, optionally, CLC-DEC shall be sent.

2.4.4 If the Gateway PBX receives either a Diversion Follow-Me Request or Diversion Cancellation request it shall reject them with a CRM containing the Clearing Cause: SSI and, optionally, CLC-DEC.

2.4.5 If a Gateway PBX receives an ISRM or RM containing a Diversion Bypass Request (DIV-BY), the String shall be ignored and the call shall be processed in accordance with the remainder of the message.

2.4.6 If a call to a PBX acting as a Gateway to Decadic is Diverted Immediate or On Busy via that signalling system it shall follow the procedures shown in SECTION 6, Paragraph 2.4.1 with the addition that the NAM shall contain the String Diverted Externally (DVD-E) with the Parameter "I", if Diverted Immediate, or "B", if Diverted On Busy.

2.4.7 If a call to a PBX acting as a Gateway to Decadic is Diverted On No Reply via that signalling system the call shall be established in accordance with the procedures for that signalling system. If the call is set up successfully an EEM containing the String Diverted Externally (DVD-E) with the Parameter "R" shall be sent to the Originating PBX.

2.5 INTERWORKING WITH SSMF5 (SSMF5 Diversion Supplementary Service Supported)

Call Diversion is an optional Supplementary Service in SSMF5. This Paragraph details the requirements, for interworking between DPNSS 1 and SSMF5, when the Gateway PBX supports the Diversion Supplementary Service for both signalling systems.

2.5.1 OUTLINE OF OPERATION

Interworking of the Diversion Supplementary Service between DPNSS 1 and SSMF5 is provided by the following signalling sequences:

2.5.2 Immediate/Busy Diversion from an SSMF5 extension to DPNSS 1

2.5.3 Diverting call from DPNSS 1 to SSMF5

2.5.4 Immediate/Busy Diversion from a DPNSS 1 extension to SSMF5

2.5.5 Diverting call from SSMF5 to DPNSS 1

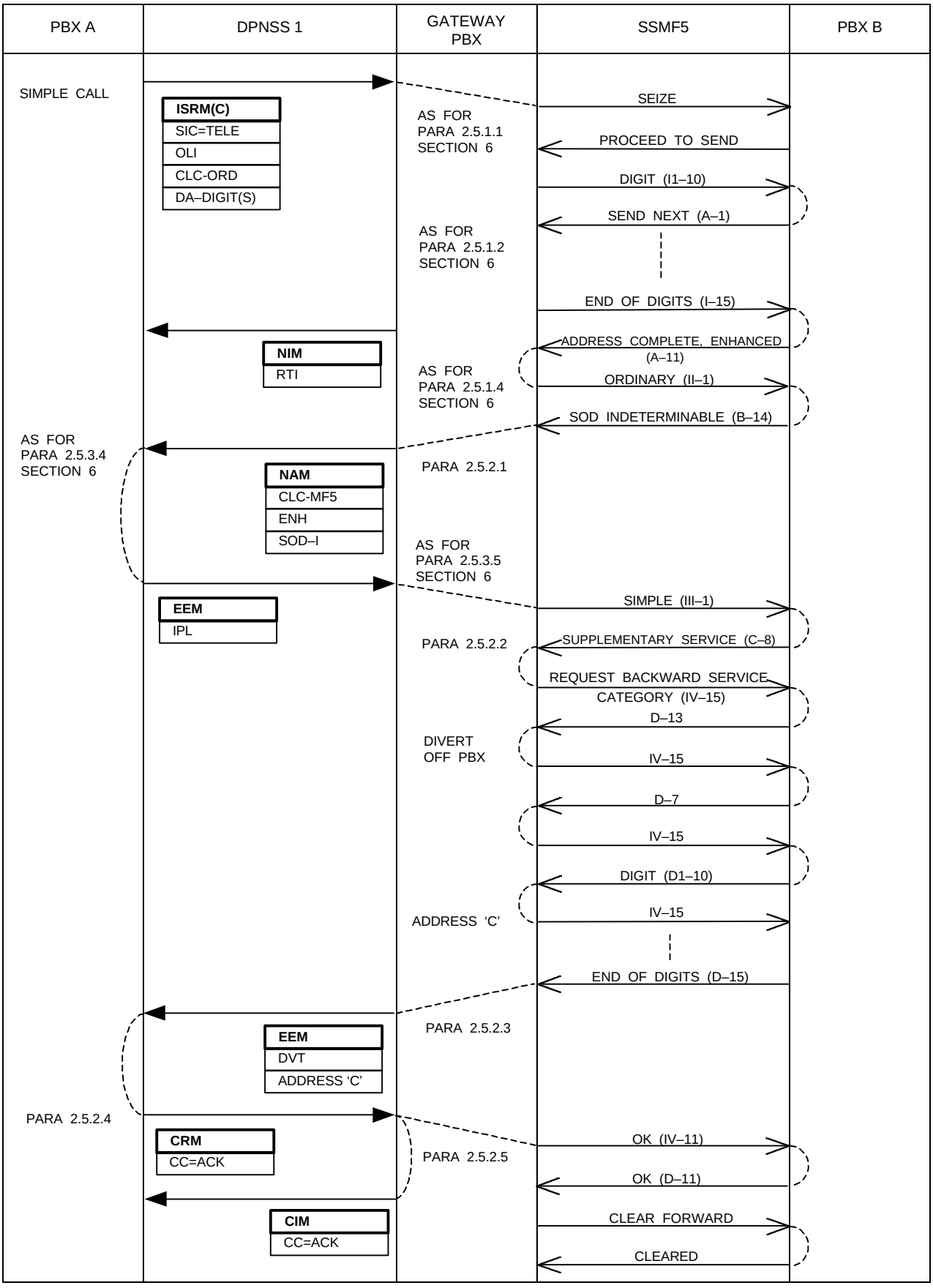
2.5.6 By-Pass of Call Diversion from DPNSS 1 to SSMF5

2.5.7 By-Pass of Call Diversion from SSMF5 to DPNSS 1

NOTES: SSMF5 does not support Diversion on No-Reply. However, calls from DPNSS 1 that are Diverting on No-Reply are handled by the Gateway PBX in the same way as Diverting Immediate calls.

SSMF5 does not provide Diversion Registration. The handling of DPNSS 1 Diversion Registration Requests is given in Paragraph 2.6.

2.5.2 IMMEDIATE/BUSY DIVERSION FROM AN SSMF5 EXTENSION TO DPNSS 1



2.5.2.1 On Receipt of the SSMF5 SOD Indeterminable signal (B-14) the Gateway sends a NAM containing CLC-MF5, ENH and SOD-I to the Originating PBX.

2.5.2.2 On receipt of the SSMF5 Supplementary Service Signal (C-8) the Gateway PBX awaits for the End of Digits Signal before sending information to the Originating PBX.

2.5.2.3 On receipt of the SSMF5 End of Digits Signal the Gateway PBX sends an EEM containing DVT to indicate that the call is being diverted.

NOTE: SSMF5 does not distinguish between Busy and Immediate Diversion.

If an SSMF5 Reject signal (D-12) is received during service information transfer, a CRM containing Clearing Cause: NT is sent to the Originating PBX and a CIM expected in response. The SSMF5 route is cleared as detailed in the appropriate specification.

2.5.2.4 On receipt of the EEM containing DVT the behaviour of the Originating PBX is the same as shown in response to a NAM containing DVT-I in DPNSS[188] SECTION 11 Paragraph 2.3.5 or 2.3.6 except for the use of the DVG String.

2.5.2.5 On receipt of a CRM containing Clearing Cause: CT the Gateway PBX returns a CIM to the Originating PBX and sends an OK-Conclude Signal (IV-11) on the SSMF5 route. The SSMF5 route is cleared as detailed in the appropriate specification.

If the CRM contains a Clearing Cause other than CT, the SSMF5 call is cleared as above, except that the SSMF5 signal IV-12 (Reject-Conclude) is sent instead of IV-11 (OK-Conclude).

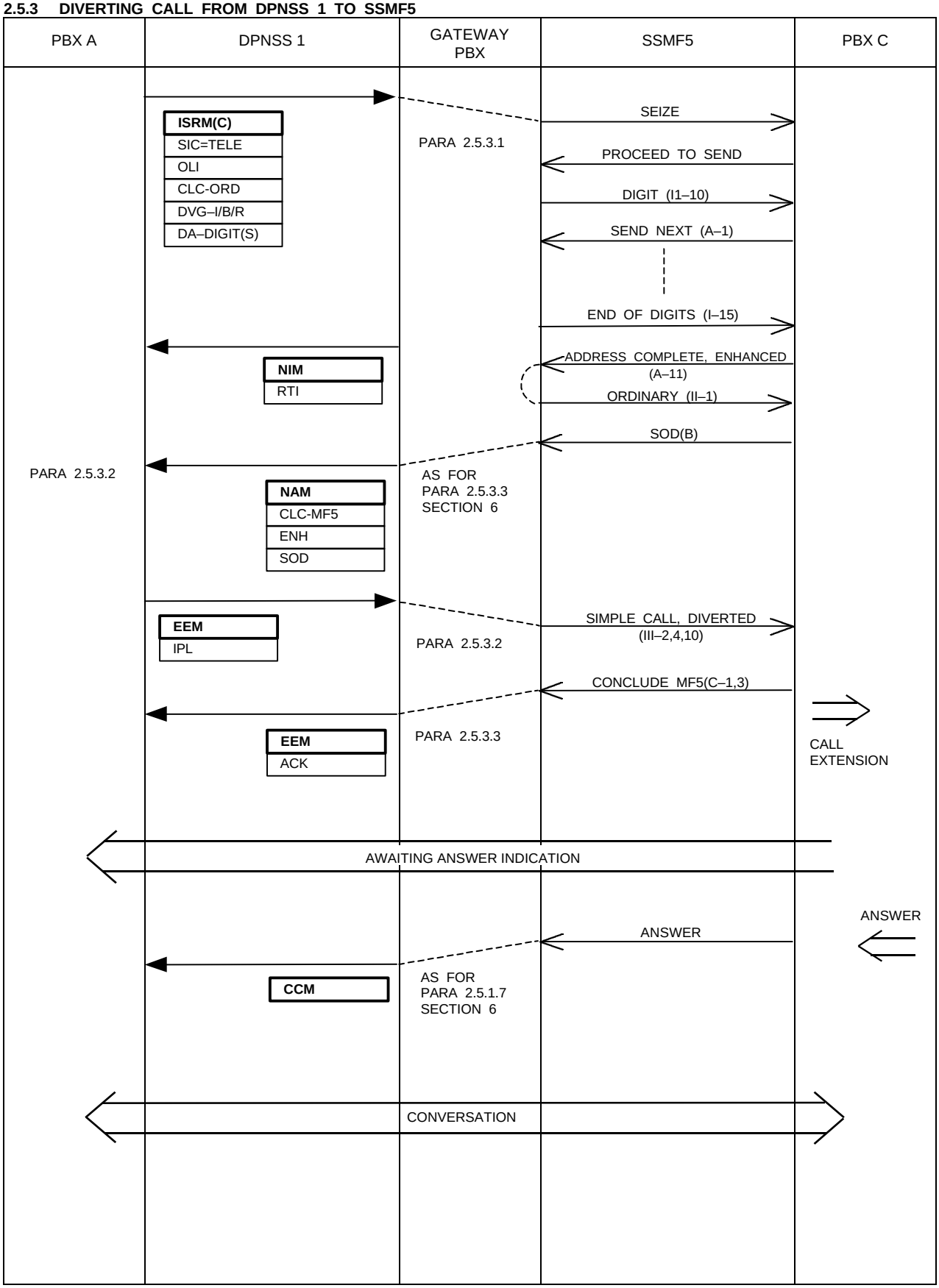
If the existing SSMF5 call clears after DVT has been sent but before a response is received, the DPNSS 1 signalling is not affected. If no CRM is received (eg there is no response within a suitable time period, or an EEM with SNU indicating the DVT String is received) a CRM with Clearing Cause: NT is sent to the DPNSS 1 channel and a CIM is expected in response. The SSMF5 call is cleared as for receipt of a CRM containing a Clearing Cause other than CT.

In the case of Single Channel Working within the DPNSS 1 part of the network the Gateway PBX may receive a Recall Message (RM) containing DVG. On receipt of an RM the Gateway PBX determines whether the call should be made via the existing SSMF5 route or via a new route.

If the call is made to a DPNSS 1 route the existing SSMF5 call is released and a new call set up as detailed in DPNSS[188] SECTION 11 Paragraph 2.3.6.2. The Gateway PBX now becomes a Transit PBX.

If the new call is made via the SSMF5 route, the existing SSMF5 call is released and a new call set up as detailed in Paragraph 2.5.3.

2.5.3 DIVERTING CALL FROM DPNSS 1 TO SSMF5



2.5.3.1 The ISRM shall be dealt with as detailed in SECTION 6, Paragraph 2.5.1.1 except that the DVG-I, DVG-B and DVG-R information and the address of 'B' is stored by the Gateway PBX for use later in call establishment.

2.5.3.2 The action of the PBXs in the DPNSS 1 network on receipt of the NAM will differ depending upon the type of Diversion taking place.

In the case of Diversion Immediate or Diversion on Busy the Originating PBX will send an EEM containing the Intrusion Protection Level (IPL) of the calling party.

If the Diverting Call is due to No-Reply the NAM will be used by the Originating PBX or, in the case of Single Channel Working, the Branching PBX to decide whether to release the original call or the diverting call.

i. If the NAM contains SOD-F the original call will be released and an EEM containing the IPL of the calling extension will be returned from the Originating PBX.

ii. If the NAM contains SOD-B the Diverting Call will be released and the original call will be maintained. The Gateway PBX will therefore receive a CRM and will clear the SSMF5 route.

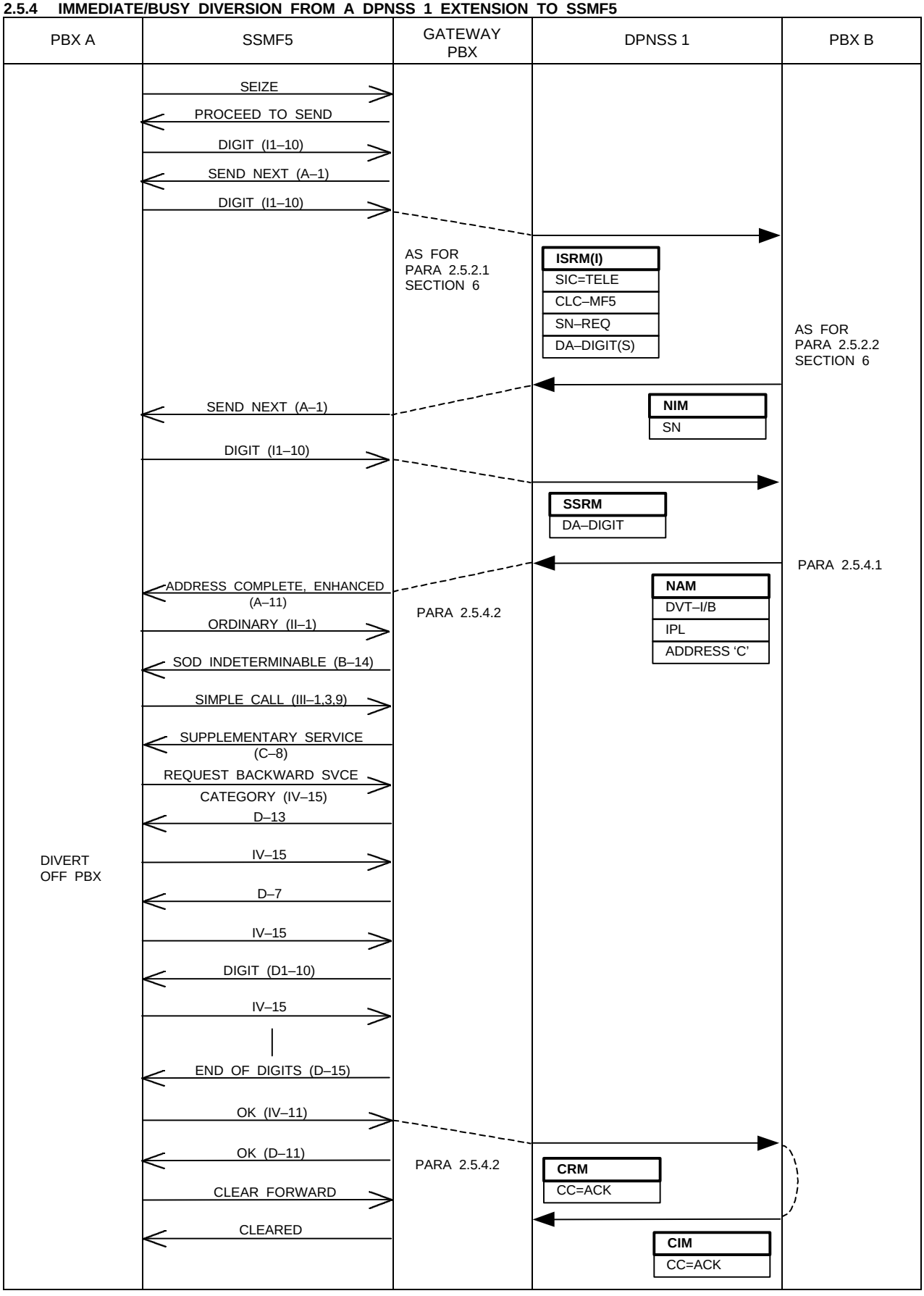
If the Diverting Call fails within the SSMF5 network a CRM will be sent by the Gateway PBX instead of the NAM and the Originating PBX will maintain the original call.

2.5.3.3 On receipt of an EEM containing IPL the Gateway PBX sends one of the SSMF5 Group III Diverted Signals (III-2, 4 or 10), to PBX C. This will allow a Diverted Call Indication to be given to the incoming extension. It may also be used to control diversion chaining within the SSMF5 network.

2.5.3.4 If the Gateway PBX receives an SSMF5 Conclude-MF5 Signal it sends an EEM containing ACK to the calling PBX.

If an SSMF5 Call Failure signal is received the Gateway PBX sends a CRM with an appropriate Clearing Cause (eg Access Barred) mapped as shown in SECTION 6 Paragraph 2.5.1.5.

2.5.4 IMMEDIATE/BUSY DIVERSION FROM A DPNSS 1 EXTENSION TO SSMF5



2.5.4.1 As for SECTION 6, Paragraph 2.5.2.2 except that the NAM indicates that the called extension is diverting calls (ie DVT-I or DVT-B) and the address of the nominated extension is given as a Parameter.

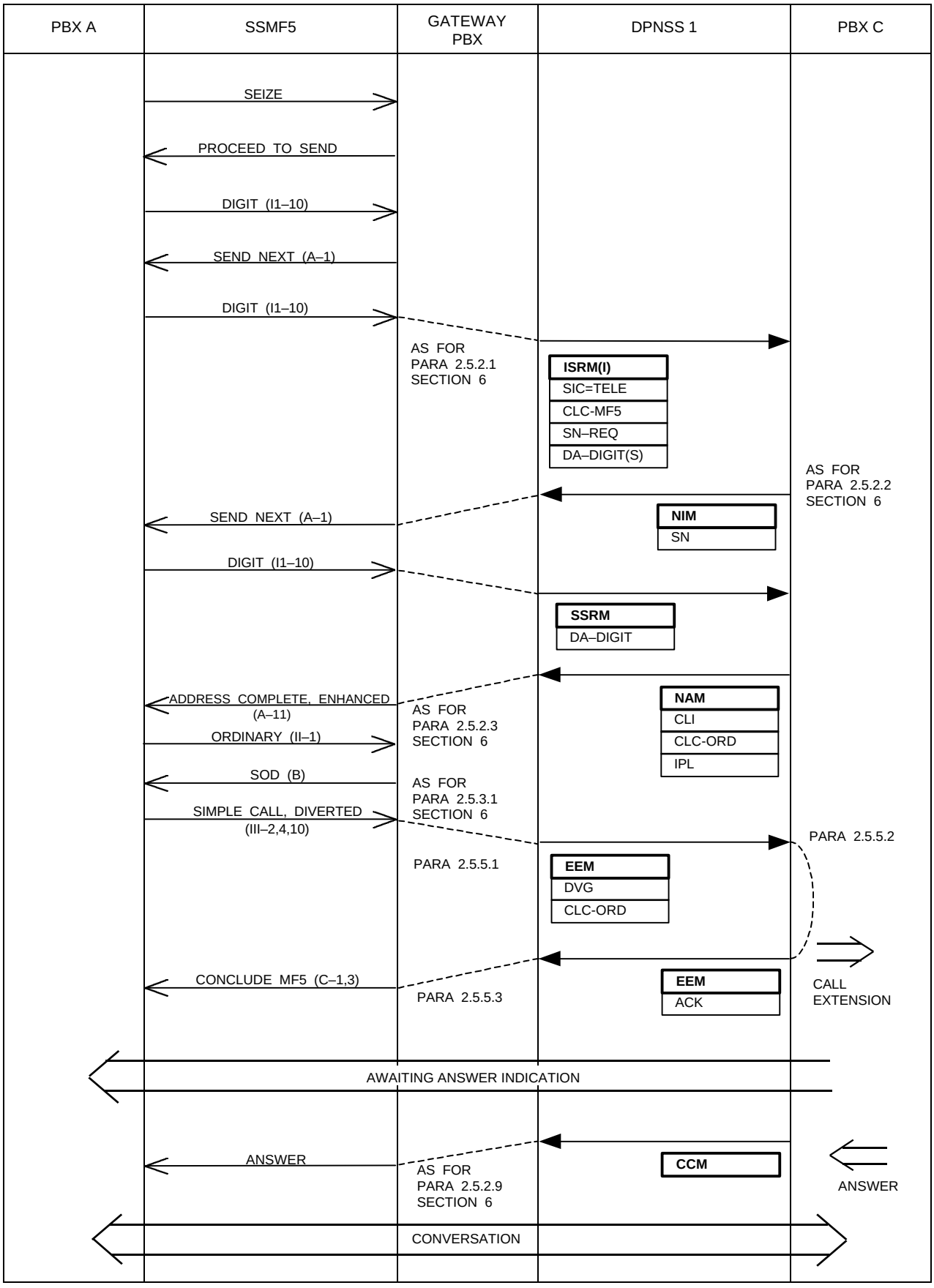
2.5.4.2 On receipt of the NAM the group B Signal sent to the SSMF5 route shall be "SOD Indeterminable" (B-14).

When the SSMF5 group III signal is received, providing it indicates a Simple Call, the SSMF5 Group C signal indicating a Supplementary Service (C-8) shall be sent. The SSMF5 two signal message D-13 and D-7 shall be sent indicating Diversion Off PBX. On receipt of the SSMF5 OK-Conclude MF5 signal (IV 11) a CRM containing Clearing Cause: ACK shall be sent to the Terminating PBX, and a CIM expected in response. The SSMF5 OK-Conclude MF5 signal (D-11) shall be sent to the Originating PBX.

If the new call is wholly SSMF5 the signalling shown in the appropriate specification shall be used.

If, during the transfer of SSMF5 information, an SSMF5 Request Rejected signal (IV-12) is received, a CRM containing Clearing Cause: SU shall be sent to the Terminating PBX and a CIM expected in response.

2.5.5 DIVERTING CALL FROM SSMF5 TO DPNSS 1



2.5.5.1 On receipt of the SSMF5 Group III Diverted signal the Gateway PBX shall send an EEM containing the CLC of the calling party and the string DVG.

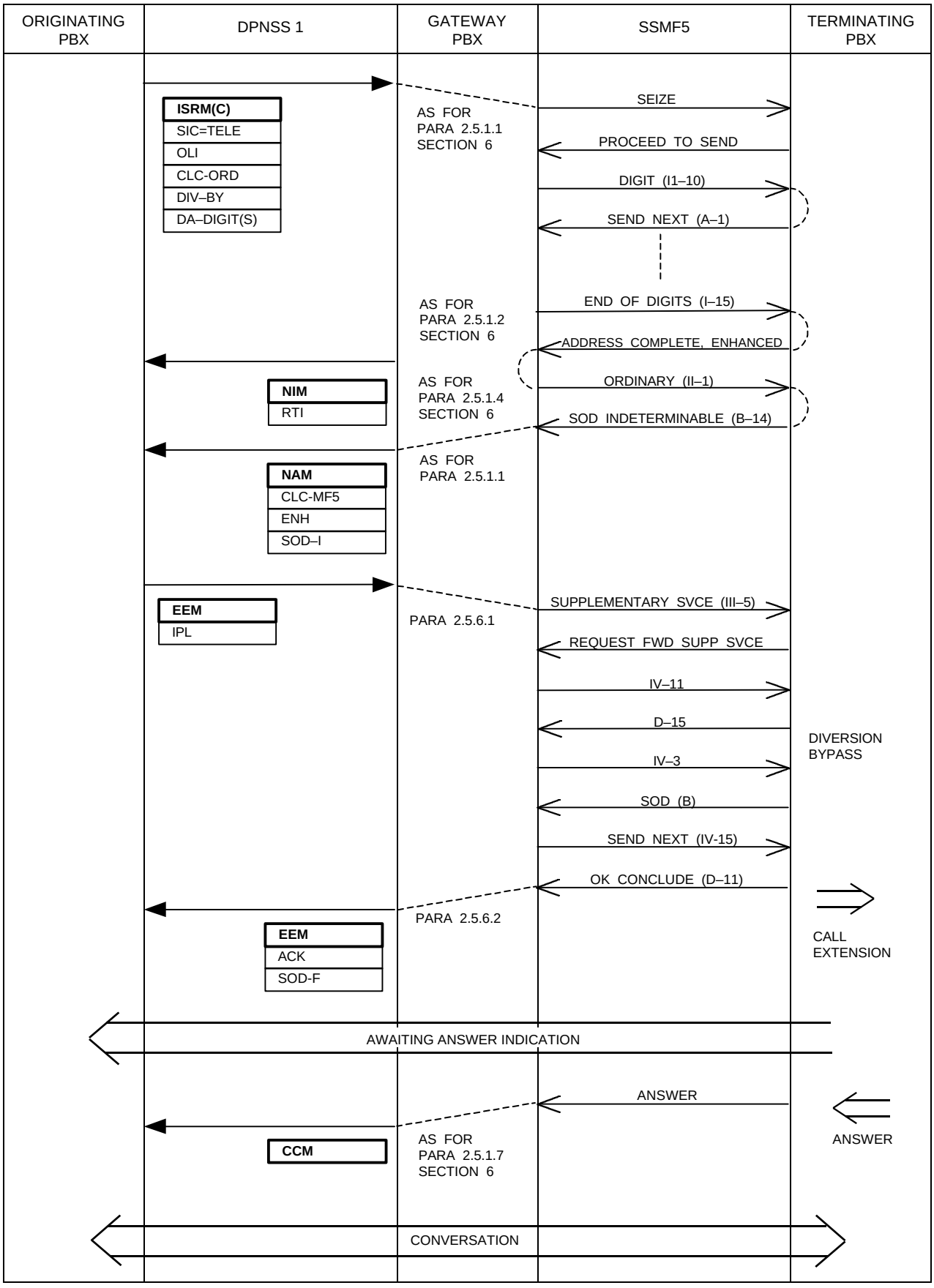
2.5.5.2 When the Terminating PBX receives the EEM containing DVG it shall check that the call may be completed, and if so shall send an EEM containing ACK and call the extension.

If the call cannot be completed then a CRM containing the appropriate Clearing Cause (eg Access Barred) shall be returned.

2.5.5.3 On receipt of an EEM containing ACK the Gateway PBX shall send an SSMF5 Conclude-MF5 signal to the Originating PBX.

If a CRM is received the Gateway PBX shall send an SSMF5 Call Failure Signal (C-4).

2.5.6 BY PASS OF CALL DIVERSION FROM DPNSS 1 TO SSMF5



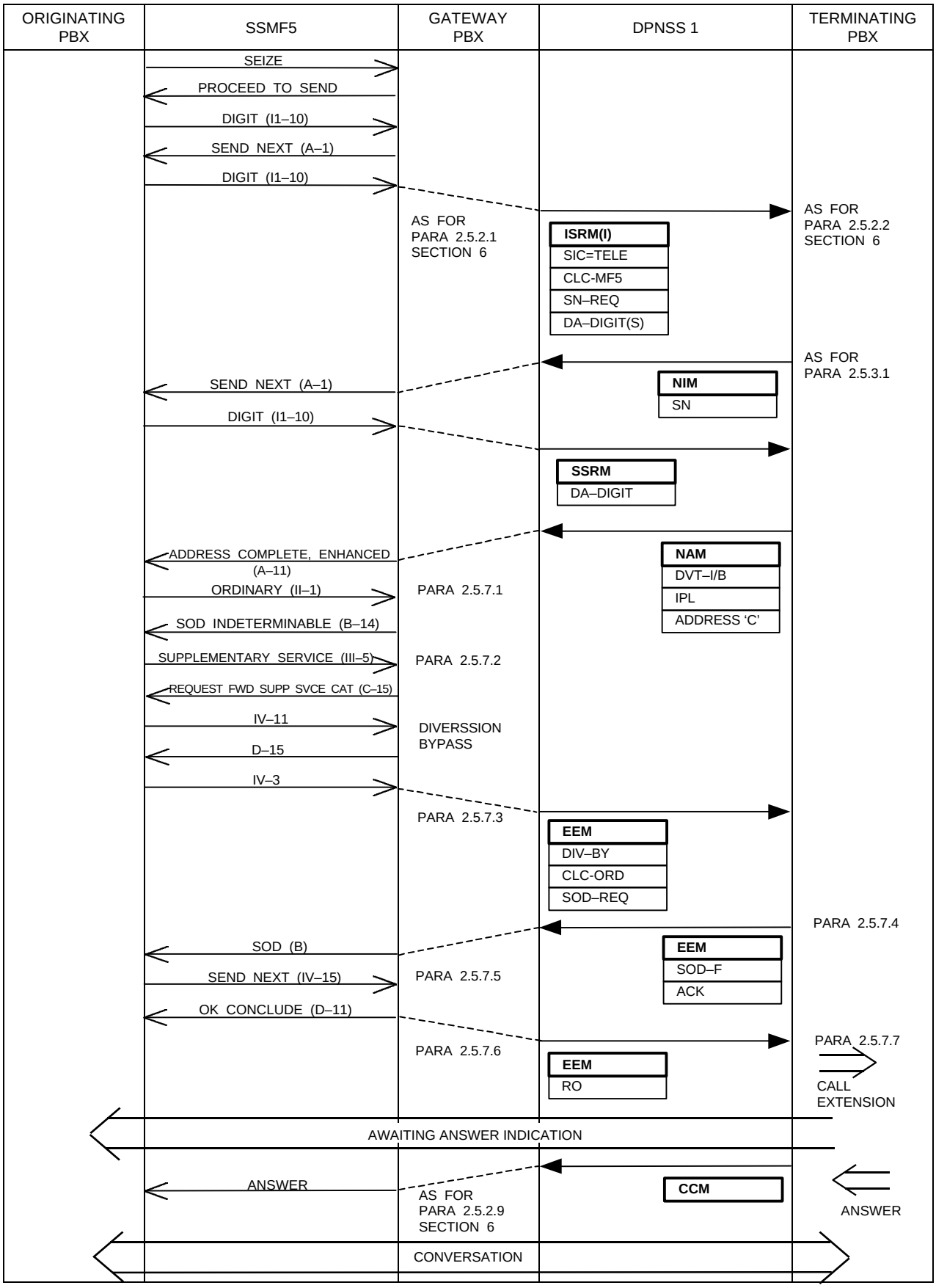
2.5.6.1 Following receipt of an SSMF5 signal B-14 and on receipt of an EEM containing IPL the Gateway PBX shall send the SSMF5 Supplementary Service Signal III-5, III-7 or III-11 mapped as shown in Paragraph 2.5.3.5 SECTION 6 followed by the SSMF5 two signal message IV-11 + IV-3 which indicates Diversion By-Pass Request. The Terminating PBX shall return a Group B signal indicating the SOD of the called party.

2.5.6.2 On receipt of the SSMF5 OK-Conclude Signal (D-11) if the previous SSMF5 Group B signal indicated that the called extension was free, the Gateway PBX shall send an EEM containing ACK and SOD-F thus notifying the calling party that Diversion By-Pass has succeeded.

If, on receipt of the SSMF5 D-11 signal, the previous SSMF5 Group B signal had indicated that the called extension was busy, the Gateway PBX sends a CRM containing Clearing Cause: BY. The SSMF5 link shall be cleared.

If an SSMF5 Request Rejected signal D-12 is received during the transfer of SSMF5 information the Gateway PBX shall release the SSMF5 link and send a CRM containing Clearing Cause: SU. A CIM is expected in response.

2.5.7 BYPASS OF CALL DIVERSION FROM SSMF5 TO DPNSS 1



2.5.7.1 On receipt of a NAM containing DVT-I or DVT-B the Gateway PBX shall send an SSMF5 Group B signal "SOD Indeterminable" (B-14).

2.5.7.2 On receipt of an SSMF5 Forward Supplementary Service signal (III-5) the Gateway PBX shall await further SSMF5 signalling.

2.5.7.3 On the receipt of the SSMF5 Diversion Bypass Request the Gateway PBX shall send an EEM Containing DIV-BY, CLC-ORD and SOD-REQ and withhold further SSMF5 signalling while awaiting the outcome of the Diversion By-Pass Request.

2.5.7.4 On receipt of an EEM containing DIV-BY the request shall be validated, and if successful the SOD of the wanted party checked. If the party is free an EEM containing SOD-F and ACK shall be sent. If the party is busy a CRM containing Clearing Cause: BY shall be sent. A CIM is expected in response.

If the validation is unsuccessful a CRM containing Clearing Cause: SU shall be sent.

2.5.7.5 On receipt of an EEM containing ACK and SOD-F the Gateway PBX shall send the SSMF5 SOD-Free Signal.

If a CRM containing Clearing Cause: BY is received the Gateway PBX shall send the SSMF5 SOD-Busy Signal.

If a CRM containing Clearing Cause: SU is received the Gateway PBX shall send the SSMF5 Call Failed Incoming Calls Barred Signal (B-8).

2.5.7.6 On receipt of the SSMF5 Send Next Signal Request (IV-15) the Gateway PBX shall send an EEM containing String RO and shall return the SSMF5 OK-Conclude Signal (D-11).

2.5.7.7 On receipt of an EEM containing RO the diverting party shall have calling signal applied and the transmission path switched through.

2.6 INTERWORKING WITH SSMF5 (SSMF5 Diversion Supplementary Service Not Supported)

Call Diversion is an optional Supplementary Service in SSMF5. This Paragraph details the requirements for interworking between DPNSS 1 and SSMF5 when the Gateway PBX supports SSMF5 but not the SSMF5 Diversion Supplementary Service.

2.6.1 If a PBX, acting as a Gateway to SSMF5, receives a Diverting Call (an ISRM or RM containing DVG-I, DVG-B or DVG-R) it may allow the call to proceed as a Simple Call to SSMF5 or, alternatively, it may bar access to SSMF5.

If the call is not allowed to proceed and there is no other suitable route the call shall be rejected by a CRM or, in the case of Single Channel Working, by an RRM. The CRM or RRM shall contain the Clearing Cause: SSI and, optionally, CLC-MF5.

If the call is allowed to proceed it shall follow the procedures shown in SECTION 6, Paragraph 2.5.1 (Basic) or 2.5.3 (Enhanced). The Gateway PBX shall discard the DVG-I, DVG-B or DVG-R String.

If the Diversion is on No-Reply (DVG-R) the NAM sent by the Gateway PBX shall be used by the Originating PBX or, in the case of Single Channel Working, the Branching PBX to decide whether to release the original call or the diverting call.

i. If the NAM contains "BASIC" or if it contains "ENH" plus SOD-F the original call shall be released and the diverting call shall be maintained.

ii. If the NAM contains ENH plus SOD-B the diverting call shall be released and the original call shall be maintained.

If Single Channel Working has been used in the DPNSS 1 network and branching occurs at a PBX where the new call enters SSMF5, that PBX shall perform both the Branching and Gateway functions. The behaviour of the Branching/Gateway PBX is equivalent to that of separate Branching and Gateway PBXs communicating over a DPNSS 1 channel. The Branching function shall be in accordance with DPNSS[188] SECTION 11, Paragraph 2.3.6, 2.3.8 or 2.3.10. The Gateway function shall be in accordance with SECTION 6 Paragraph 2.5.1 (Basic) or 2.5.3 (Enhanced).

2.6.2 An incoming call from SSMF5 may encounter an extension within the DPNSS 1 network which has Diversion registered. Under these circumstances the Gateway will receive either:

i. a NAM containing DVT-I, DVT-B, DVD-I, DVD-B or DVD-E

or ii. an EEM containing DVT-R, DVD-E or DVD-R.

On receipt of a DVD string in either a NAM or an EEM the call shall continue as a Simple Call in accordance with SECTION 6, Paragraph 2.5.2(Basic) or 2.5.4(Enhanced). The DVD string shall be discarded by the Gateway PBX.

On receipt of a NAM containing DVT-I or DVT-B the Gateway PBX shall act on the DPNSS 1 side as shown for an Originating PBX in DPNSS[188] SECTION 11, except that CLC-MF5 shall be used. On the SSMF5 side the Gateway shall act as shown in SECTION 6, Paragraph 2.5.2 (Basic) or 2.5.4 (Enhanced), except that the sending of the Address Complete Signal is delayed until a NAM is received on the diverted call. The signalling shall then continue as for a Simple Call from SSMF5 to DPNSS 1.

On receipt of an EEM containing DVT-R the Gateway PBX shall act on the DPNSS 1 side, as shown for an Originating PBX in DPNSS[188] SECTION 11, except that CLC-MF5 shall be used. On the SSMF5 side the signalling shall continue unchanged as for a Simple Call as shown in SECTION 6, Paragraph 2.5.2 (Basic) or 2.5.4 (Enhanced).

2.6.3 A Gateway PBX may receive a Diversion Validation Request (an ISRM containing DIV-V). If the request is successful the procedures of DPNSS[188] SECTION 11 shall apply, with the Gateway PBX acting in the same way as a DPNSS 1 Terminating PBX, except that CLC-MF5 shall be included in a CRM containing Clearing Cause: ACK. If the request is rejected a CRM shall be sent containing Clearing Cause: SSI and, optionally, CLC-MF5 .

2.6.4 If the Gateway PBX receives either a Diversion Follow-Me Request or a Diversion Cancellation Request it shall reject them with a CRM containing Clearing Cause: SSI and, optionally, CLC-MF5 .

2.6.5 If a Gateway PBX receives an ISRM or RM containing a Diversion Bypass Request (DIV-BY), the String shall be ignored and the call shall be processed in accordance with the remainder of the message.

2.6.6 If a call to a PBX acting as a Gateway to SSMF5 is Diverted Immediate or On Busy via that signalling system it shall follow the procedures shown in SECTION 6, Paragraph 2.5.1 (Basic) or 2.5.3 (Enhanced) with the addition that the NAM shall contain the String Diverted Externally (DVD-E) with the Parameter "I", if Diverted Immediate, or "B", if Diverted On Busy.

2.6.7 If a call to a PBX acting as a Gateway to SSMF5 is Diverted On No Reply via that signalling system the call shall be established in accordance with the procedures shown in the appropriate specification. If the call is set up successfully an EEM, containing the String Diverted Externally (DVD-E) with Parameter "R", shall be sent to the Originating PBX.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 12 - SUPPLEMENTARY SERVICE : HOLD

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HISTORY

Issue 1 - May 1985
Issue 2 - March 1988

Issue 3 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Hold Supplementary Service.

1.2 Subsection 2 details the Hold Supplementary Service when DPNSS 1 interworks with other signalling systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide the Hold Supplementary Service, there is no PSTN signalling involved.

However, if a PBX acting as a Gateway to the PSTN receives a Hold Request (an EEM containing HOLD-REQ) it shall respond with an EEM containing ACK to the requesting PBX. Music or an announcement may be connected to the PSTN circuit and removed on receipt of an EEM containing RECON or SOD-F.

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide the Hold Supplementary Service there is no DASS 2 signalling involved.

However, if a PBX acting as a Gateway to DASS 2 receives a Hold Request (an EEM containing HOLD-REQ) it shall respond with an EEM containing ACK. Music or an announcement may be connected to the DASS 2 channel and removed on receipt of an EEM containing RECON or SOD-F.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED.

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

As a Decadic route does not provide the Hold Supplementary Service there is no Decadic signalling involved.

However, if a PBX acting as a Gateway to Decadic receives a Hold Request (an EEM containing HOLD-REQ) it shall respond with an EEM containing ACK. Music or an announcement may be connected to the Decadic circuit and removed on receipt of an EEM containing RECON or SOD-F.

2.5 INTERWORKING WITH SSMF5

As SSMF5 does not provide the Hold Supplementary Service there is no SSMF5 signalling involved.

However, if a PBX acting as a Gateway to SSMF5 receives a Hold Request (an EEM containing HOLD-REQ) it shall respond with an EEM containing ACK. Music or an announcement may be connected to the SSMF5 circuit and removed on receipt of an EEM containing RECON or SOD-F.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 13 - SUPPLEMENTARY SERVICE : THREE PARTY

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HISTORY

Issue 1 - May 1985
Issue 2 - March 1988

Issue 3 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Three Party Supplementary Service.

1.2 Subsection 2 details the Three Party Supplementary Service when DPNSS 1 interworks with other signalling systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide the Three Party Supplementary service, there is no special PSTN signalling involved.

However, the PSTN can passively participate in a three party situation by acting as one of the non-controlling parties. This can arise in two ways:

2.1.1 A DPNSS 1 extension involved in a call to or from the PSTN makes an Enquiry Call to a third party. Single channel working may be used where the two calls take the same route through the DPNSS 1 network; branching will occur before or at the Gateway PBX.

2.1.2 A DPNSS 1 extension involved in a call makes an Enquiry Call to the PSTN. The Gateway PBX, on receipt of an Enquiry Request (String ENQ in the ISRM) shall allow the call to proceed as if a Simple Call request had been received. The procedures shown in SECTION 6 Paragraph 2.1.1 shall apply. Single Channel Working may be used where the two calls take the same route through the DPNSS 1 network; branching will occur before or at the Gateway PBX.

Once the Enquiry Call is established, the Gateway PBX behaves as a non-controlling party PBX for the purpose of acting upon End to End messages relating to the Three Party Service:

2.1.3 On receipt of an EEM containing Transferred (TRFD) the Gateway PBX must respond with an EEM containing CLC-PSTN (TID or CLI is optional). If a CCM has not yet been sent on behalf of the PSTN trunk, SOD-F shall also be included in the EEM.

The PBX must be capable of understanding the contents of the subsequent EEM containing details of the other party so that:

i. A connection which does not comply with current regulatory rules can be barred, and

ii. the call state (ie Answered or Awaiting Answer) of the other party can be correctly determined.

2.1.4 On receipt of an EEM containing Add-on Validation (AD-V) the Gateway PBX must respond with an EEM containing either ACK and CLC-PSTN (TID or CLI is optional), or, if Add-On is not permitted, REJ.

2.1.5 EEMs containing Added On (AD-O) may be ignored.

2.1.6 EEMs containing TWP must be checked as they contain CLCs which must be used to comply with regulatory rules.

In addition to the rules governing Transfer as detailed in SECTION 13 of DPNSS[188], the Controlling PBX may permit the transfer of a PSTN trunk where it and the other non-controlling party are unanswered if and only if the other non-controlling party is internal to the DPNSS 1 network (ie it has CLC ORD or OP). Under such a situation, both PBXs will receive the string SOD-F in the EEM containing the CLC and CLI of the other party. Either PBX may take special action, such as Redirection or automatic clear, either immediately or on expiry of a "No Answer" timeout.

The Controlling PBX shall not attempt any action which would result in a connection which is not permitted, nor shall it attempt any action which would result in a connection which could not be cleared because of the inability of either party to generate a Release signal.

NOTE: The Gateway PBX may also perform the Branching function. The behaviour of the PBX should be equivalent to that of separate Branching and Gateway PBXs communicating over a DPNSS 1 channel.

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide the Three Party Supplementary Service, there is no special DASS 2 signalling involved.

However, a DASS 2 channel can passively participate in a three party situation by acting as one of the non-controlling parties. This can arise in two ways:

2.2.1 A DPNSS 1 extension involved in a call to or from DASS 2 makes an Enquiry Call to a third party. Single Channel Working may be used where the two calls take the same route through the DPNSS 1 network; branching will occur before or at the Gateway PBX.

2.2.2 A DPNSS 1 extension involved in a call makes an Enquiry Call to DASS 2. The Gateway PBX, on receipt of an Enquiry Request (String ENQ in the ISRM) shall allow the call to proceed as if a Simple Call request had been received. The procedures shown in SECTION 6 Paragraph 2.2.1 shall apply. Single Channel Working may be used where the two calls take the same route through the DPNSS 1 network; branching will occur before or at the Gateway PBX.

Once the Enquiry Call is established, the Gateway PBX behaves as a non-controlling party PBX for the purpose of acting upon End to End messages relating to the Three Party Service:

2.2.3 On receipt of an EEM containing Transferred (TRFD) the Gateway PBX must respond with an EEM containing CLC-ISDN (CLI is optional). If a DASS 2 CCM is awaited from the DASS 2 channel, SOD-F should also be included.

The PBX must be capable of understanding the contents of the subsequent EEM containing details of the other party so that:

i. A connection which does not comply with current regulatory rules can be barred, and

ii. the call state (ie Answered or Awaiting Answer) of the other party can be correctly determined.

2.2.4 On receipt of an EEM containing Add-on Validation (AD-V) the Gateway PBX must respond with an EEM containing either ACK and CLC-ISDN (CLI is optional), or, if add-on is not permitted, REJ.

2.2.5 EEMs containing Added On (AD-O) may be ignored.

2.2.6 EEMs containing TWP must be checked as they contain CLCs which must be used to comply with DTI rules.

In addition to the rules governing Transfer as detailed in SECTION 13 of DPNSS[188], the Controlling PBX may permit the transfer of a DASS 2 trunk where it and the other non-controlling party are unanswered if and only if the other non-controlling party is internal to the DPNSS 1 network (ie it has CLC ORD or OP). Under such a situation, both PBXs will receive the string SOD-F in the EEM containing the CLC and CLI of the other party. Either PBX may take special action, such as Redirection or automatic clear, either immediately or on expiry of a "No Answer" timeout.

The Controlling PBX shall not attempt any action which would result in a connection which is not permitted, nor shall it attempt any action which would result in a connection which could not be cleared because of the inability of either party to generate a Release signal.

NOTE: The Gateway PBX may also perform the Branching function. The behaviour of the PBX should be equivalent to that of separate Branching and Gateway PBXs communicating over a DPNSS 1 channel.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED.

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

As a Decadic route does not provide the Three Party Supplementary Service, there is no Decadic signalling involved.

However, a Decadic route can passively participate in a three party situation by acting as one of the non-controlling parties. This can arise in two ways:

2.4.1 A DPNSS 1 extension involved in a call to or from a Decadic route makes an Enquiry Call to a third party. Single Channel Working may be used where the two calls take the same route through the DPNSS 1 network; branching will occur before or at the Gateway PBX.

2.4.2 A DPNSS 1 extension involved in a call makes an Enquiry Call to a Decadic route. The Gateway PBX, on receipt of an Enquiry Request (String ENQ in the ISRM) shall allow the call to proceed as if a Simple Call request had been received. The procedures shown in SECTION 6 Paragraph 2.4.1 shall apply. Single Channel Working may be used where the two calls take the same route through the DPNSS 1 network; branching will occur before or at the Gateway PBX.

Once the Enquiry Call is established, the Gateway PBX behaves as a non-controlling party PBX for the purpose of acting upon End to End messages relating to the Three Party Service:

2.4.3 On receipt of an EEM containing Transferred (TRFD) the Gateway PBX must respond with an EEM containing CLC-DEC (TID or CLI is optional). If a CCM has not yet been sent on behalf of the Decadic trunk, SOD-F shall also be included.

The PBX must be capable of understanding the contents of the subsequent EEM containing details of the other party so that:

i. A connection which does not comply with current regulatory rules can be barred, and

ii. the call state (ie Answered or Awaiting Answer) of the other party can be correctly determined.

2.4.4 On receipt of an EEM containing Add-On Validation (AD-V) the Gateway PBX must respond with an EEM containing either ACK and CLC-DEC (CLI is optional), or, if Add-On is not permitted, REJ.

2.4.5 EEMs containing Added On (AD-O) may be ignored.

2.4.6 EEMs containing TWP must be checked as they contain CLCs which must be used to comply with DTI rules.

In addition to the rules governing Transfer as detailed in SECTION 13 of DPNSS[188], the Controlling PBX may permit the transfer of a Decadic trunk where it and the other non-controlling party are unanswered if and only if the other non-controlling party is internal to the DPNSS 1 network (ie it has CLC ORD or OP). Under such a situation, both PBXs will receive the string SOD-F in the EEM containing the CLC and CLI of the other party. Either PBX may take special action, such as Redirection or automatic clear, either immediately or on expiry of a "No Answer" timeout.

The Controlling PBX shall not attempt any action which would result in a connection which is not permitted, nor shall it attempt any action which would result in a connection which could not be cleared because of the inability of either party to generate a Release signal.

NOTE: The Gateway PBX may also perform the Branching function. The behaviour of the PBX should be equivalent to that of separate Branching and Gateway PBXs communicating over a DPNSS 1 channel.

2.5 INTERWORKING WITH SSMF5

As an SSMF5 route does not provide the Three Party Supplementary Service, there is no SSMF5 signalling involved.

However, an SSMF5 route can passively participate in a three party situation by acting as one of the non-controlling parties. This can arise in two ways:

2.5.1 A DPNSS 1 extension involved in a call to or from an SSMF5 route makes an Enquiry Call to a third party. Single Channel Working may be used where the two calls take the same route through the DPNSS 1 network; branching will occur before or at the Gateway PBX.

2.5.2 A DPNSS 1 extension involved in a call makes an Enquiry Call to an SSMF5 route. The Gateway PBX, on receipt of an Enquiry Request (String ENQ in the ISRM) shall allow the call to proceed as if a Simple Call request had been received. The procedures shown in SECTION 6 Paragraph 2.5.1 or 2.5.3 shall apply. Single Channel Working may be used where the two calls take the same route through the DPNSS 1 network; branching will occur before or at the Gateway PBX.

Once the Enquiry Call is established, the Gateway PBX behaves as a non-controlling party PBX for the purpose of acting upon End to End messages relating to the Three Party Service:

2.5.3 On receipt of an EEM containing Transferred (TRFD) the Gateway PBX must respond with an EEM containing the CLC and CLI of the remote (SSMF5) party. If these are not known CLC-MF5 may be sent and CLI omitted. If a CCM has not yet been sent on behalf of the SSMF5 trunk, SOD-F shall also be included.

The PBX must be capable of understanding the contents of the subsequent EEM containing details of the other party so that:

i. A connection which does not comply with current regulatory rules can be barred, and

ii. The call state (ie Answered or Awaiting Answer) of the other party can be correctly determined.

2.5.4 On receipt of an EEM containing Add-On Validation (AD-V) the Gateway PBX must respond with an EEM containing the CLC and CLI of the remote (SSMF5) party. If these are not known CLC-MF5 may be sent and CLI omitted. Alternatively, an EEM containing REJ may be sent if Add-On is not permitted.

2.5.5 EEMs containing Added On (AD-O) may be ignored.

2.5.6 EEMs containing TWP must be checked as they contain CLCs which must be used to comply with DTI rules.

In addition to the rules governing Transfer as detailed in SECTION 13 of DPNSS[188], the Controlling PBX may permit the transfer of a SSMF5 trunk where it and the other non-controlling party are unanswered if and only if the other non-controlling party is internal to the DPNSS 1 network (ie it has CLC ORD or OP). Under such a situation, both PBXs will receive the string SOD-F in the EEM containing the CLC and CLI of the other party. Either PBX may take special action, such as Redirection or automatic clear, either immediately or on expiry of a "No Answer" timeout.

The Controlling PBX shall not attempt any action which would result in a connection which is not permitted, nor shall it attempt any action which would result in a connection which could not be cleared because of the inability of either party to generate a Release signal.

NOTE: The Gateway PBX may also perform the Branching function. The behaviour of the PBX should be equivalent to that of separate Branching and Gateway PBXs communicating over a DPNSS 1 channel.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 14 - SUPPLEMENTARY SERVICE : CALL OFFER

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2.5 SSMF5 (SSMF5 Call Waiting Supplementary Service Supported) .....Page 4

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HISTORY

Issue 1 - May 1985
Issue 2 - March 1988

Issue 3 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Call Offer Supplementary Service.

1.2 Subsection 2 details the Call Offer Supplementary Service when DPNSS 1 interworks with other signalling systems. In general the description is given in the form of explanatory text but in the case of SSMF5 Message Sequence Diagrams (MSDs) are also included.

1.3 Alternative action (eg for unsuccessful calls) not shown in MSDs is given in accompanying text. The text is referred to in the MSDs at appropriate points in the sequences.

1.4 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide the Call Offer Supplementary Service there is no special PSTN signalling involved.

2.1.1 If a PBX acting as a Gateway to the PSTN receives a Call Offer Request (ISRM containing CO), it shall allow the call to proceed as if a Simple Call Request had been made. The procedures shown in SECTION 6 Paragraph 2.1.1 shall be followed.

2.1.2 A DPNSS 1 extension involved in a call to a PSTN customer (eg receiving busy tone) will have a Call Offer Request rejected by the originating PBX.

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide the Call Offer Supplementary Service there is no special DASS 2 signalling involved.

2.2.1 If a PBX acting as a Gateway to DASS 2 receives a Call Offer Request (ISRM containing CO), it shall allow the call to proceed as if a Simple Call Request had been made. The procedures shown in SECTION 6 Paragraph 2.2.1 shall be followed.

2.2.2 A DPNSS 1 extension involved in a call to a busy ISDN customer will have a Call Offer Request rejected by the Originating PBX.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

As a Decadic route does not provide the Call Offer Supplementary Service, there is no special Decadic signalling involved.

2.4.1 If a PBX acting as a Gateway to a Decadic route receives a Call Offer Request (ISRM containing CO), it shall allow the call to proceed as if a Simple Call Request had been made. The procedures shown in SECTION 6 Paragraph 2.4.1 shall be followed.

2.4.2 A DPNSS 1 extension involved in a call to a Decadic extension (eg receiving busy tone) will have a Call Offer Request rejected by the Originating PBX.

2.5 INTERWORKING WITH SSMF5 (SSMF5 Call Waiting Supplementary Service Supported)

The DPNSS 1 Call Offer Supplementary Service is equivalent to the SSMF5 Call Waiting Supplementary Service.

Call Waiting is an optional Supplementary Service in SSMF5. The following paragraphs detail the requirements for interworking between the DPNSS 1 Call Offer Supplementary Service and the SSMF5 Call Waiting Supplementary Service when the Gateway PBX supports both Supplementary Services.

OUTLINE OF OPERATION

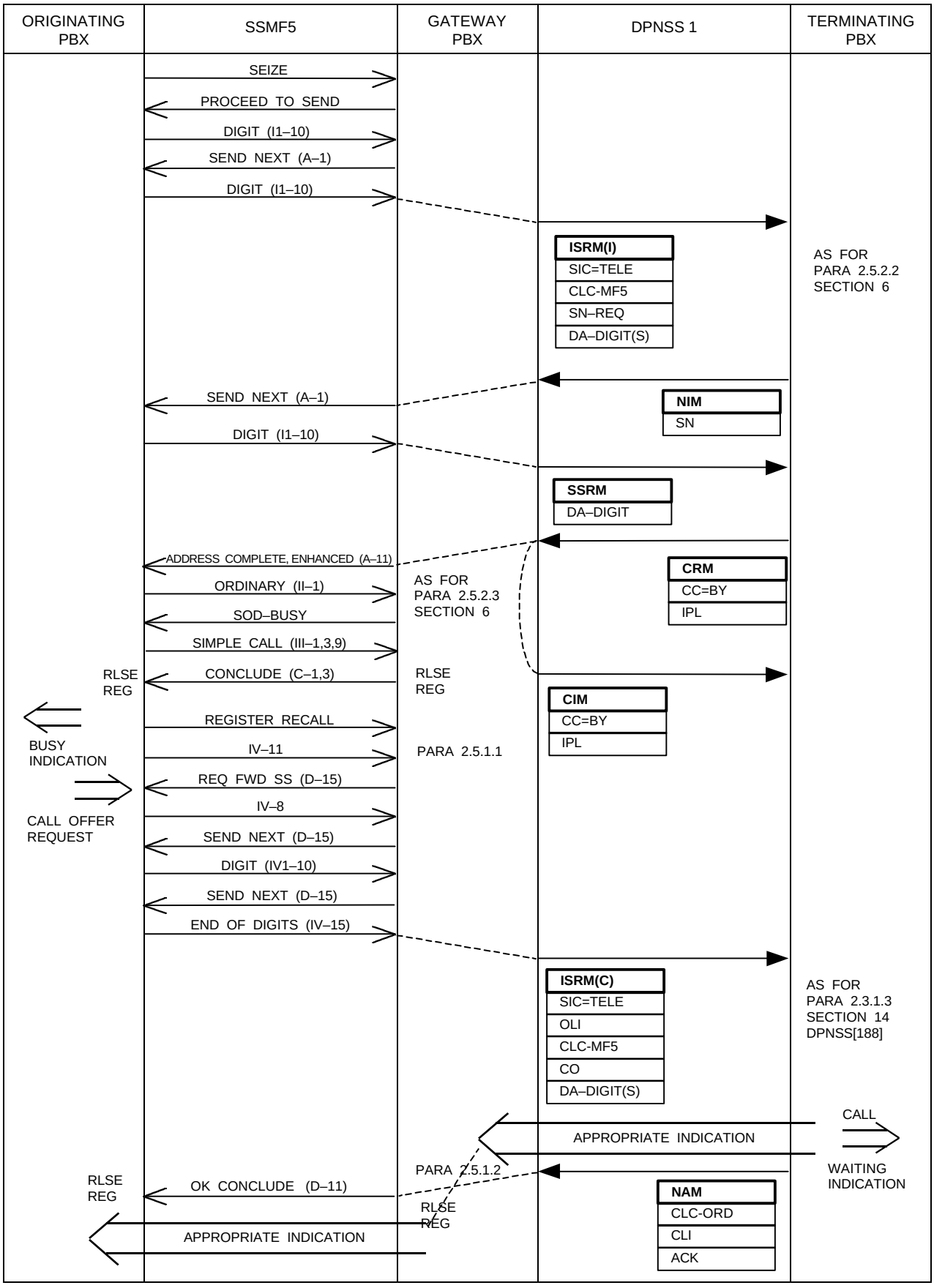
Interworking between SSMF5 Call Waiting Supplementary Service and DPNSS 1 Call Offer service is provided by the following signal sequences:

2.5.1 Call Waiting Supplementary Service from SSMF5 to DPNSS 1

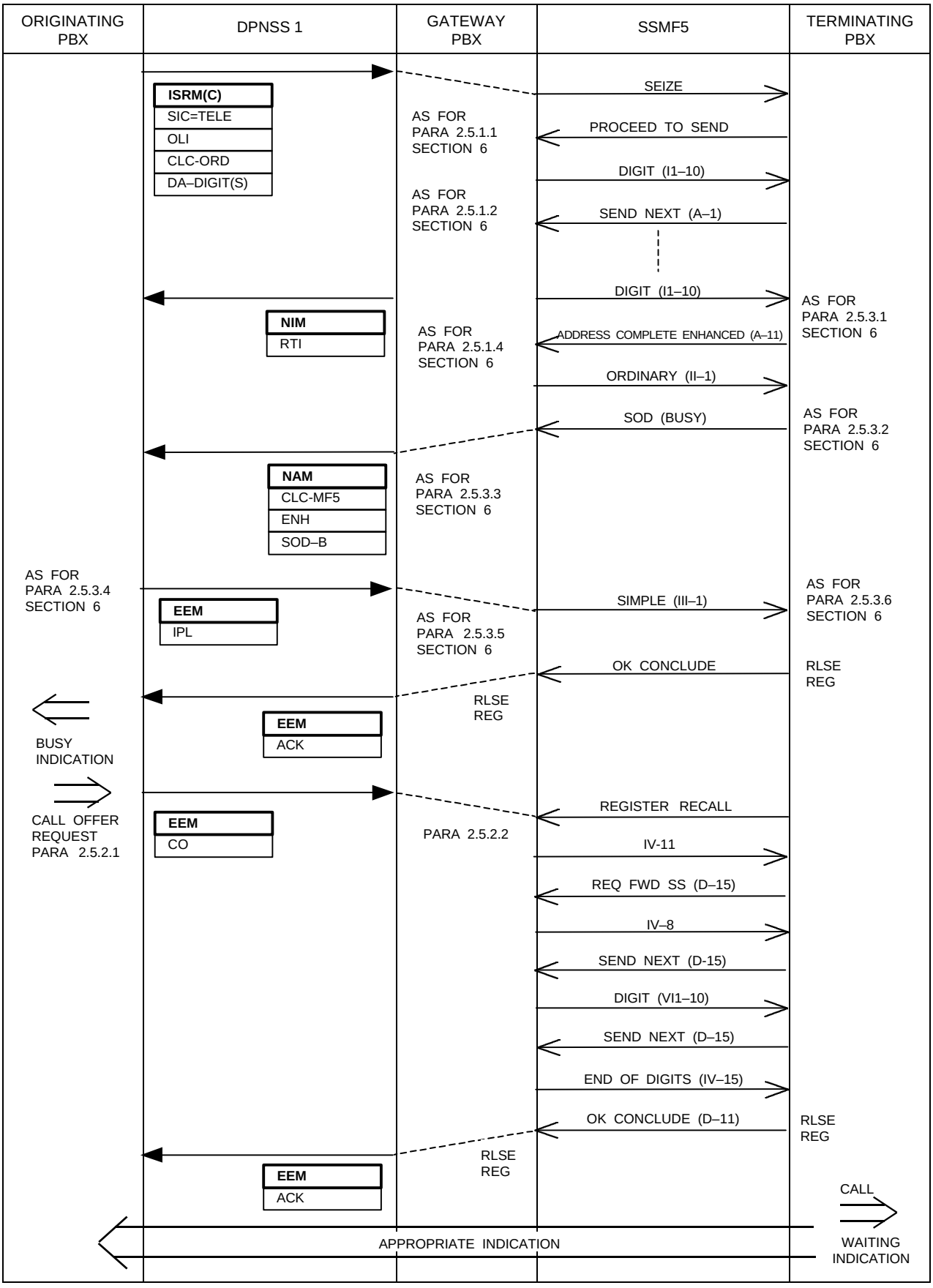
2.5.1.1 When a Register Recall is received the Gateway PBX associates an SSMF5 register and awaits the Supplementary Service Request. The SSMF5 two signal code IV-11 + IV-8 indicates a Call Waiting Request, SSMF5 signalling continues until the CLI has been received by the Gateway. On receipt of the End of Digits signal an ISRM(C) is sent containing CLC-MF5 and the string CO. The Destination Address is known by the Gateway from the previous call.

2.5.1.2 On receipt of the NAM either with or without ACK the Gateway PBX sends the SSMF5 OK-Conclude MF5 signal D-11, releases the register and switches through the Transmission path, enabling the appropriate indication to be sent to the calling party. The call is completed as for DPNSS 1 signalling with the CCM being mapped to the line signal Answer. If a CRM is received the Request Not Accepted signal is returned to the Originating PBX. Receipt of an EEM shall not cause further signalling on the SSMF5 path.

2.5.1 CALL OFFER SERVICE FROM SSMF5 TO DPNSS 1



2.5.2 CALL OFFER SERVICE FROM DPNSS 1 TO SSMF5



2.5.2 Call Offer Supplementary Service from DPNSS 1 to SSMF5

2.5.2.1 When the calling party requests Call Offer the Originating PBX validates the request, and if successful sends an EEM containing CO.

2.5.2.2 On receipt of the EEM containing CO the Gateway PBX sends a Register Recall on the SSMF5 route. The Call Waiting Supplementary Service is then identified by the SSMF5 two signal code IV-11 + IV-8 and the Calling Line Identity is provided if requested. When the End of Digits is sent, if the service is acceptable an SSMF5 signal OK-Conclude is received and the registers released. On receipt of the OK-Conclude signal the Gateway PBX sends an EEM containing ACK to the Originating PBX and the appropriate indication is applied to the calling party.

The call is completed with the SSMF5 Answer line signal mapped to a CCM.

If a rejection occurs at the terminating PBX and a Request Not Accepted signal is received (D-12), an EEM containing REJ is returned on the signalling channel.

2.6 INTERWORKING WITH SSMF5 (SSMF5 Call Waiting Supplementary Service not Supported)

Call Waiting is an optional Supplementary Service in SSMF5. The following paragraphs detail the requirements for interworking between DPNSS 1 and SSMF5 when the Gateway PBX supports SSMF5 but not the SSMF5 Call Waiting Supplementary Service.

2.6.1 If a PBX acting as a Gateway to SSMF5, receives a Call Offer request (ISRM containing CO), it shall allow the call to proceed as if a Simple Call had been made. The procedures shown in SECTION 6 Paragraph 2.5.1 (Basic) or 2.5.3 (Enhanced) shall be followed.

2.6.2 A DPNSS 1 extension involved in a call to a busy SSMF5 extension will have a Call Offer Request rejected by the Originating PBX.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 15 - SUPPLEMENTARY SERVICE : NON SPECIFIED INFORMATION

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2.5 SSMF5 .....Page 4

HISTORY

Issue 1 - May 1985
Issue 2 - March 1988

Issue 3 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Non-Specified Information (NSI) Supplementary Service.

1.2 Subsection 2 details the NSI Supplementary Service when DPNSS 1 interworks with other signalling systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide the Non Specified Information Supplementary Service, there is no special PSTN signalling involved.

However, if a PBX acting as a Gateway to the PSTN receives an NSI Request which is recognised and valid, then it shall act upon the NSI Request in a manufacturer dependent manner.

Alternatively, if the Gateway PBX receives an NSI Request which is unrecognised or invalid, then the NSI Request shall be handled in accordance with the requirements of SECTION 5 of DPNSS[188].

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide the Non Specified Information Supplementary Service there is no special DASS 2 signalling involved.

However, if a PBX acting as a Gateway to DASS 2 receives an NSI Request which is recognised and valid then it shall act upon the NSI Request in a manufacturer dependent manner.

Alternatively, if the Gateway PBX receives an NSI Request which is unrecognised or invalid then the NSI Request shall be handled in accordance with the requirements of SECTION 5 of DPNSS[188].

2.3 INTERWORKING VIA DASS 2

NOT ISSUED.

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

As a Decadic route does not provide the Non Specified Information Service, there is no special Decadic signalling involved.

However, if a PBX acting as a Gateway to a Decadic route receives an NSI Request which is recognised and valid then it shall act upon the NSI Request in a manufacturer dependent manner.

Alternatively, if a Gateway PBX receives an NSI Request which is unrecognised or invalid then the NSI Request shall be handled in accordance with the requirements of SECTION 5 of DPNSS[188].

2.5 INTERWORKING WITH SSMF5

As SSMF5 does not provide the Non Specified Information Supplementary Service, there is no special SSMF5 signalling involved.

However, if a PBX acting as a Gateway to SSMF5 receives an NSI Request which is recognised and valid then it shall act upon the NSI Request in a manufacturer dependent manner.

Alternatively, if a Gateway PBX receives an NSI Request which is unrecognised or invalid then the NSI Request shall be handled in accordance with the requirements of SECTION 5 of DPNSS[188].

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 16 - SERVICE INDEPENDENT STRINGS

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2.5 SSMF5 .....Page 6

HISTORY

Issue 1 - March 1988

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REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for Service Independent Strings.

1.2 Subsection 2 details a number of Supplementary Information Strings which may be used in association with the Simple Call, or with Supplementary Services for interworking with other signalling systems.

1.3 These strings may appear in Real or Virtual Calls interworking with other signalling systems.

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN cannot convey SERVICE INDEPENDENT STRINGS, there is no PSTN signalling involved. However, a PSTN Gateway PBX may interact with these Strings as follows:

2.1.1 CLASS OF SERVICE (COS)

A PSTN circuit may be assigned a COS, in which case the String may be sent. If the PSTN Gateway receives a COS String, the Gateway may act upon it as defined in DPNSS[188] SECTION 16.

2.1.2 HUNT GROUP FORWARD (HGF)

This String shall be ignored upon receipt, and shall never be sent by a PSTN Gateway.

2.1.3 SATELLITE BARRED (SAT-B)

If the routing is via a satellite, then the Gateway may act, otherwise it should be ignored. The String may be sent if a satellite route is not wanted.

2.1.4 DIRECT ROUTE SELECT (DRS)

The Gateway may act upon the String if it is received. The String may also be sent if required.

2.1.5 TEXTUAL DISPLAY (TEXT)

The Gateway shall ignore this String when it is received. Text may be registered against a Circuit, in which case it may be sent.

2.1.6 INTERCOM CALL (ICC)

An originating PSTN Gateway may supply the String ICC, on behalf of a PSTN circuit, if deemed appropriate. If a PSTN Gateway receives an ICC String it may either take whatever action is appropriate to handling Intercom Calls or it may ignore the String. In addition, if ICC is received in an ISRM, the Gateway PBX may reject the call with a CRM containing the Clearing Cause: SSI if it does not support Intercom Calls outside the private network.

2.1.7 QUEUE INFORMATION (Q-INFO)

The Gateway shall ignore this String when it is received. The String may be sent, as described in DPNSS[188] SECTION 16.

2.1.8 PASSWORD (PASSW)

Where a particular service requires the use of the PASSW String in order to complete or register a Supplementary Service, the action of the Gateway PBX will be dependent upon the Supplementary Service involved. If the password is either missing, incorrect or invalid, then the Gateway will reject the attempt and clear the call.

2.1.9 BUSY INFORMATION (BY-INFO)

The Gateway may send the String if required, and act upon it if the String is received (eg automatic Call Offer).

2.1.10 TRUNK IDENTITY (TID)

The Gateway shall ignore this String when it is received. The string may be sent as defined in SECTION 6 (Simple Call).

2.1.11 SUPPLEMENTARY FACILITIES INHIBITED (SFI)

The Gateway shall ignore this String when it is received. The SFI string may be registered against a trunk, in which case it may be sent.

2.2 INTERWORKING WITH DASS 2

As DASS 2 cannot convey SERVICE INDEPENDENT STRINGS, there is no DASS 2 signalling involved. However the DASS 2 Gateway PBX may interact with these Strings as follows:

2.2.1 CLASS OF SERVICE (COS)

A DASS 2 channel may be assigned a COS, in which case the String may be sent. If the DASS 2 Gateway receives a COS String, the Gateway may act upon it as defined in DPNSS[188] SECTION 16.

2.2.2 HUNT GROUP FORWARD (HGF)

This string shall be ignored upon receipt, and shall never be sent by a DASS 2 Gateway.

2.2.3 SATELLITE BARRED (SAT-B)

If the routing is via a satellite, then the Gateway may act on this String, otherwise it should be ignored. The String may be sent if a satellite route is not wanted.

2.2.4 DIRECT ROUTE SELECT (DRS)

The Gateway may act upon this String when it is received. The String may also be sent if required.

2.2.5 TEXTUAL DISPLAY (TEXT)

The Gateway shall ignore this String when it is received. Text may be registered against a Circuit, in which case it may be sent. If information for display is received from DASS 2 it should be passed unaltered to DPNSS as text.

2.2.6 INTERCOM CALL (ICC)

An originating DASS 2 Gateway may supply the string ICC, on behalf of a DASS 2 channel, if deemed appropriate. If a DASS 2 Gateway receives an ICC string it may either take whatever action is appropriate to handling Intercom Calls or it may ignore the String. In addition, if ICC is received in an ISRM, the Gateway PBX may reject the call with a CRM containing the Clearing Cause: SSI if it does not support Intercom Call outside the private network.

2.2.7 QUEUE INFORMATION (Q-INFO)

The Gateway shall ignore this String when it is received. The string may be sent, as described in BTNR 188 SECTION 16.

2.2.8 PASSWORD (PASSW)

Where a particular service requires the use of the PASSW String in order to complete or register a Supplementary Service, the action of the Gateway PBX will be dependent upon the Supplementary Service involved. If the password is either missing, incorrect or invalid, then the Gateway will reject the attempt and clear the call.

2.2.9 BUSY INFORMATION (BY-INFO)

The Gateway will send the string if required, and act upon it if the string is received (eg automatic Call Offer).

2.2.10 TRUNK IDENTITY (TID)

The Gateway shall ignore this String when it is received. The String may be sent as defined in SECTION 6 (Simple Call).

2.2.11 SUPPLEMENTARY FACILITIES INHIBITED (SFI)

The Gateway shall ignore this String when it is received. The SFI String may be registered against a trunk, in which case it may be sent.

2.2.12 DASS 2 SERVICE INDICATOR CODE (D-SIC)

The D-SIC String is used for conveying DASS 2 Service Indicator Codes within DPNSS 1 messages when there is no equivalent SIC coded in DPNSS 1. An example of this is the DASS 2, 3.1kHz Audio Call. The D-SIC String may be used on calls both outgoing to DASS 2 and incoming from DASS 2.

On outgoing calls the Gateway PBX may use the String to select the appropriate type of DASS 2 call. On incoming calls the Gateway PBX may include the String in the DPNSS 1 ISRM to convey a DASS 2 SIC to the Terminating PBX to assist in the selection of an appropriate extension terminal.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED.

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

The requirements for interworking with a Decadic private circuit are identical to those requirements specified in this Section for interworking with the PSTN (See paragraph 2.1).

2.5 INTERWORKING WITH SSMF5

The requirements for interworking with an SSMF5 private circuit are identical to those requirements specified in this Section for interworking with the PSTN (See paragraph 2.1).

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 17 - SUPPLEMENTARY SERVICE : CALL WAITING

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2.4 DECADIC PRIVATE CIRCUIT .....Page 3

2.5 SSMF5 .....Page 4

HISTORY

Issue 1 - May 1985
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Issue 3 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Call Waiting Supplementary Service.

1.2 Subsection 2 details the Call Waiting Supplementary Service when DPNSS 1 interworks with other signalling systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide the Call Waiting Supplementary Service there is no special PSTN signalling involved.

However, if a PBX acting as a Gateway from the PSTN receives a Call Waiting Indication (NAM containing CW), it ignores the indication and allows the call to proceed as if the called party is free. The procedures shown in SECTION 17 Paragraph 2.3.1 of DPNSS[188] shall be followed on the DPNSS 1 route.

When the DPNSS 1 CCM is received by the Gateway PBX an Answer signal is sent to the PSTN.

Clearing of the call shall be as detailed in SECTION 6 Paragraph 2.1.2.

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide the Call Waiting Supplementary Service, there is no special DASS 2 signalling involved.

However, if a PBX acting as a Gateway from DASS 2 receives a Call Waiting Indication (NAM containing CW), it ignores the indication and allows the call to proceed as if the called party is free. The procedures shown on SECTION 17 Paragraph 2.3.1 of DPNSS[188] shall be followed on the DPNSS 1 route.

When the DPNSS 1 CCM is received by the Gateway PBX it sends a DASS 2 CCM.

Clearing of the call shall be as detailed in SECTION 6 Paragraph 2.2.2.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

As a Decadic route does not provide the Call Waiting Supplementary service, there is no special Decadic signalling involved.

However, if a PBX acting as a Gateway from a Decadic route receives a Call Waiting Indication (NAM containing CW), it ignores the indication and allows the call to proceed as if the called party is free. The procedures shown in SECTION 17 Paragraph 2.3.1 of DPNSS[188] shall be followed on the DPNSS 1 route.

When the DPNSS 1 CCM is received by the Gateway PBX it sends an Answer signal on the Decadic route.

Clearing of the call shall be as detailed in SECTION 6 Paragraph 2.4.2.

2.5 INTERWORKING WITH SSMF5

As SSMF5 does not provide the Call Waiting Supplementary Service, there is no special SSMF5 signalling involved.

However, if a PBX acting as a Gateway from SSMF5 receives a Call Waiting Indication (NAM containing CW), it ignores the indication and allows the call to proceed as if the called party is free. The procedures shown in SECTION 17 Paragraph 2.3.1 of DPNSS[188] shall be followed on the DPNSS 1 route.

When the DPNSS 1 CCM is received by the Gateway PBX it sends an Answer signal on the SSMF5 route.

Clearing of the call shall be as detailed in SECTION 6 Paragraph 2.5.2.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 18 - SUPPLEMENTARY SERVICE : BEARER SERVICE SELECTION

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HISTORY

Issue 1 - May 1985
Issue 2 - March 1988

Issue 3 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Bearer Service Selection Supplementary Service.

1.2 Subsection 2 details the Bearer Service Selection Supplementary Service when DPNSS 1 interworks with other signalling systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

2.1.1 General

As the PSTN does not provide Bearer Service Selection there is no special PSTN signalling involved.

However, if a PBX acting as a DPNSS 1 Gateway to the PSTN receives a BSS string in an ISRM, RM, etc, the Gateway will respond as a normal PBX taking account of the analogue nature of the PSTN (see DPNSS[188] SECTION 18 Paragraph 2.2).

2.1.2 BSS-M : Mandatory

If a modem to suit the encoded SIC is not provided the call shall be cleared by a CRM or RRM containing a Clearing or Rejection Cause: SU with Supplementary Information String SU and optionally CLC-PSTN.

NOTE: Any modems required to meet the encoded SIC shall be reserved.

2.1.3 BSS-P : Preferred

As for DPNSS[188] SECTION 18 Paragraph 3.2.

2.1.4 BSS-N : Notification

As for DPNSS[188] SECTION 18 Paragraph 3.3.

2.2 INTERWORKING WITH DASS 2

2.2.1 General

As DASS 2 does not provide Bearer Service Selection there is no special DASS 2 signalling involved. However, some interworking is possible in accordance with the principles outlined in DPNSS[188] SECTION 18. See also the D-SIC String in SECTION 16.

2.2.2 Call from a DPNSS 1 to a DASS 2 Network

If a PBX acting as a Gateway to DASS 2 receives a BSS String in an ISRM, RM, etc, the PBX will select either a DASS 2 Category 1 or a DASS 2 Category 2 Call in accordance with the SIC and with the encoded SIC in the BSS String and taking account of whether the String is BSS-M, BSS-P, or BSS-N.

For example an ISRM containing SIC=TELE and BSS-M with an encoded SIC for Data would cause the Gateway to select a DASS2 Category 1 Voice Call.

2.2.3 Call from a DASS 2 to a DPNSS 1 Network

If a DASS 2 Category 1 or Category 2 Voice Call is received at a Gateway PBX and the Private Network uses a mixture of analogue and digital paths, then the appropriate BSS String shall be inserted in the ISRM to ensure that a 64 kbit/s DPNSS 1 channel will be selected for the call. A BSS-M String is used for Category 1 and a BSS-P String is used for Category 2. The normal SIC in the ISRM will be TELE. The SIC that is encoded within the BSS String shall be any valid DPNSS 1 SIC which has octet 1 coded as 10100000. The second octet is not used within the DPNSS network to select bearer capability and can therefore be set to any valid value.

If a 64 kbit/s DPNSS 1 channel is not available the incoming DASS 2 call shall be cleared. A CRM containing the DASS 2 Clearing Cause: Service Incompatible shall be sent to the Local Exchange and a CIM expected in response.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED.

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

2.4.1 General

As a Decadic route does not provide Bearer Service Selection there is no special Decadic signalling involved.

However, if a PBX acting as a DPNSS 1 Gateway to a Decadic route receives a BSS string in an ISRM, RM, etc, the Gateway will respond as a normal PBX taking account of the analogue nature of the Decadic route (see DPNSS[188] SECTION 18 Paragraph 2.2).

2.4.2 BSS-M : Mandatory

If a modem to suit the encoded SIC is not provided the call shall be cleared by a CRM or RRM containing a Clearing or Rejection Cause: SU with Supplementary Information String SU and optionally CLC-DEC.

NOTE: Any modems required to meet the encoded SIC shall be reserved.

2.4.3 BSS-P : Preferred

As for DPNSS[188] SECTION 18 Paragraph 3.2.

2.4.4 BSS-N : Notification

As for DPNSS[188] SECTION 18 Paragraph 3.3.

2.5 INTERWORKING WITH SSMF5

2.5.1 General

As an SSMF5 route does not provide Bearer Service Selection there is no special SSMF5 signalling involved.

However, if a PBX acting as a DPNSS 1 Gateway to an SSMF5 route receives a BSS string in an ISRM, RM, etc, the Gateway will respond as a normal PBX taking account of the analogue nature of the SSMF5 route (see DPNSS[188] SECTION 18 Paragraph 2.2).

2.5.2 BSS-M : Mandatory

If a modem to suit the encoded SIC is not provided the call shall be cleared by a CRM or RRM containing a Clearing or Rejection Cause: SU with Supplementary Information String SU and optionally CLC-MF5.

NOTE: Any modems required to meet the encoded SIC shall be reserved.

2.5.3 BSS-P : Preferred

As for DPNSS[188] SECTION 18 Paragraph 3.2.

2.5.4 BSS-N : Notification

As for DPNSS[188] SECTION 18 Paragraph 3.3.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 19 - SUPPLEMENTARY SERVICE : ROUTE OPTIMISATION

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2.5 SSMF5 .....Page 4

HISTORY

Issue 1 - May 1985
Issue 2 - March 1988

Issue 3 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Route Optimisation Supplementary Service.

1.2 Subsection 2 details the Route Optimisation Supplementary Service when DPNSS 1 interworks with other signalling systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide the Route Optimisation Supplementary Service, there is no PSTN signalling involved.

However, a PSTN Gateway PBX may receive a Route Optimisation Request (an EEM containing ROP-R) from the Originating PBX. The procedures of DPNSS[188] SECTION 19 shall apply, with the Gateway PBX acting as the Terminating PBX.

In the case of an incoming call from the PSTN, or a transferred call in which the Gateway PBX is designated as Originating, the Gateway PBX may initiate Route Optimisation. The procedures of DPNSS[188] SECTION 19 shall apply, with the Gateway PBX acting as the Originating PBX.

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide the Route Optimisation Supplementary Service there is no DASS 2 signalling involved.

However, a DASS 2 Gateway PBX may receive a Route Optimisation Request (an EEM containing ROP-R) from the Originating PBX. The procedures of DPNSS[188] SECTION 19 shall apply, with the Gateway PBX acting as the Terminating PBX.

In the case of an incoming call from a DASS 2 channel, or a transferred call in which the Gateway PBX is designated as Originating, the Gateway PBX may initiate Route Optimisation. The procedures of DPNSS[188] SECTION 19 shall apply, with the Gateway PBX acting as the Originating PBX.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED.

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

As a Decadic Route does not provide the Route Optimisation Supplementary Service, there is no Decadic signalling involved.

However, a Decadic Gateway PBX may receive a Route Optimisation Request (an EEM containing ROP-R) from the Originating PBX. The procedures of DPNSS[188] SECTION 19 shall apply, with the Gateway PBX acting as the Terminating PBX.

In the case of an incoming call from a Decadic route, or a transferred call in which the Gateway PBX is designated as Originating, the Gateway PBX may initiate Route Optimisation. The procedures of DPNSS[188] SECTION 19 shall apply, with the Gateway PBX acting as the Originating PBX.

2.5 INTERWORKING WITH SSMF5

As SSMF5 does not provide the Route Optimisation Supplementary Service, there is no SSMF5 signalling involved.

However, an SSMF5 Gateway PBX may receive a Route Optimisation Request (an EEM containing ROP-R) from the Originating PBX. The procedures of DPNSS[188] SECTION 19 shall apply, with the Gateway PBX acting as the Terminating PBX.

In the case of an incoming call from an SSMF5 route, or a transferred call in which the Gateway PBX is designated as Originating, the Gateway PBX may initiate Route Optimisation. The procedures of DPNSS[188] SECTION 19 shall apply, with the Gateway PBX acting as the Originating PBX.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 20 - SUPPLEMENTARY SERVICE : EXTENSION STATUS

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HISTORY

Issue 1 - May 1985
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Issue 3 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Extension Status Supplementary Service.

1.2 Subsection 2 details the Extension Status Supplementary Service when DPNSS 1 interworks with other signalling systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide the Extension Status Supplementary Service, there is no PSTN signalling involved.

However, if a PBX acting as a Gateway to the PSTN, receives an Extension Status Call, (an ISRM containing String EST) it shall respond with a Clear Request Message (CRM) containing the Clearing Cause: SSI and optionally CLC-PSTN. A CIM is expected in response.

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide the Extension Status Supplementary Service there is no DASS 2 signalling involved.

However, if a PBX acting as a Gateway to DASS 2 receives an Extension Status Call, (an ISRM containing String EST) it shall respond with a Clear Request Message (CRM) containing the Clearing Cause: SSI and optionally CLC-DASS. A CIM is expected in response.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED.

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

As a Decadic route does not provide the Extension Status Supplementary Service there is no Decadic signalling involved.

However, if a PBX acting as a Gateway to a Decadic route receives an Extension Status Call, (an ISRM containing String EST) it shall respond with a Clear Request Message (CRM) containing the Clearing Cause: SSI and optionally CLC-DEC. A CIM is expected in response.

2.5 INTERWORKING WITH SSMF5

As SSMF5 does not provide the Extension Status Supplementary Service, there is no SSMF5 signalling involved.

However, if a PBX acting as a Gateway to a SSMF5 receives an Extension Status Call, (an ISRM containing String EST) it shall respond with a Clear Request Message (CRM) containing the Clearing Cause: SSI and optionally CLC-MF5. A CIM is expected in response.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 21 - SUPPLEMENTARY SERVICE : CONTROLLED DIVERSION

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HISTORY

Issue 1 - May 1985
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Issue 3 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Controlled Diversion Supplementary Service.

1.2 Subsection 2 details the Controlled Diversion Supplementary Service when DPNSS 1 interworks with other signalling systems. In general the description is given in the form of explanatory text but, in the case of SSMF5, Message Sequence Diagrams (MSDs) are also included.

1.3 Alternative action (eg for unsuccessful calls) not shown in MSDs is given in accompanying text. The text is referred to in the MSDs at appropriate points in the sequences.

1.4 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide the Controlled Diversion Supplementary Service, there is no special PSTN signalling involved.

However, if a PBX acting as a Gateway to the PSTN receives a Controlled Diversion Request (an ISRM containing CDIV) it shall allow the call to proceed as if a Simple Call Request had been made. The procedures shown in SECTION 6, Paragraph 2.1.1 shall be followed.

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide the Controlled Diversion Supplementary Service at present, there is no special DASS 2 signalling involved.

However, if a PBX acting as a Gateway to DASS 2 receives a Controlled Diversion Request (an ISRM containing CDIV) it shall allow the call to proceed as if a Simple Call Request had been made. The procedures shown in SECTION 6, Paragraph 2.2.1 shall be followed.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

As a Decadic route does not provide the Controlled Diversion Supplementary Service, there is no special Decadic signalling involved.

However, if a PBX acting as a Gateway to a Decadic route receives a Controlled Diversion Request (an ISRM containing CDIV), it shall allow the call to proceed as if a Simple Call Request had been made. The procedures shown in SECTION 6, Paragraph 2.4.1 shall be followed.

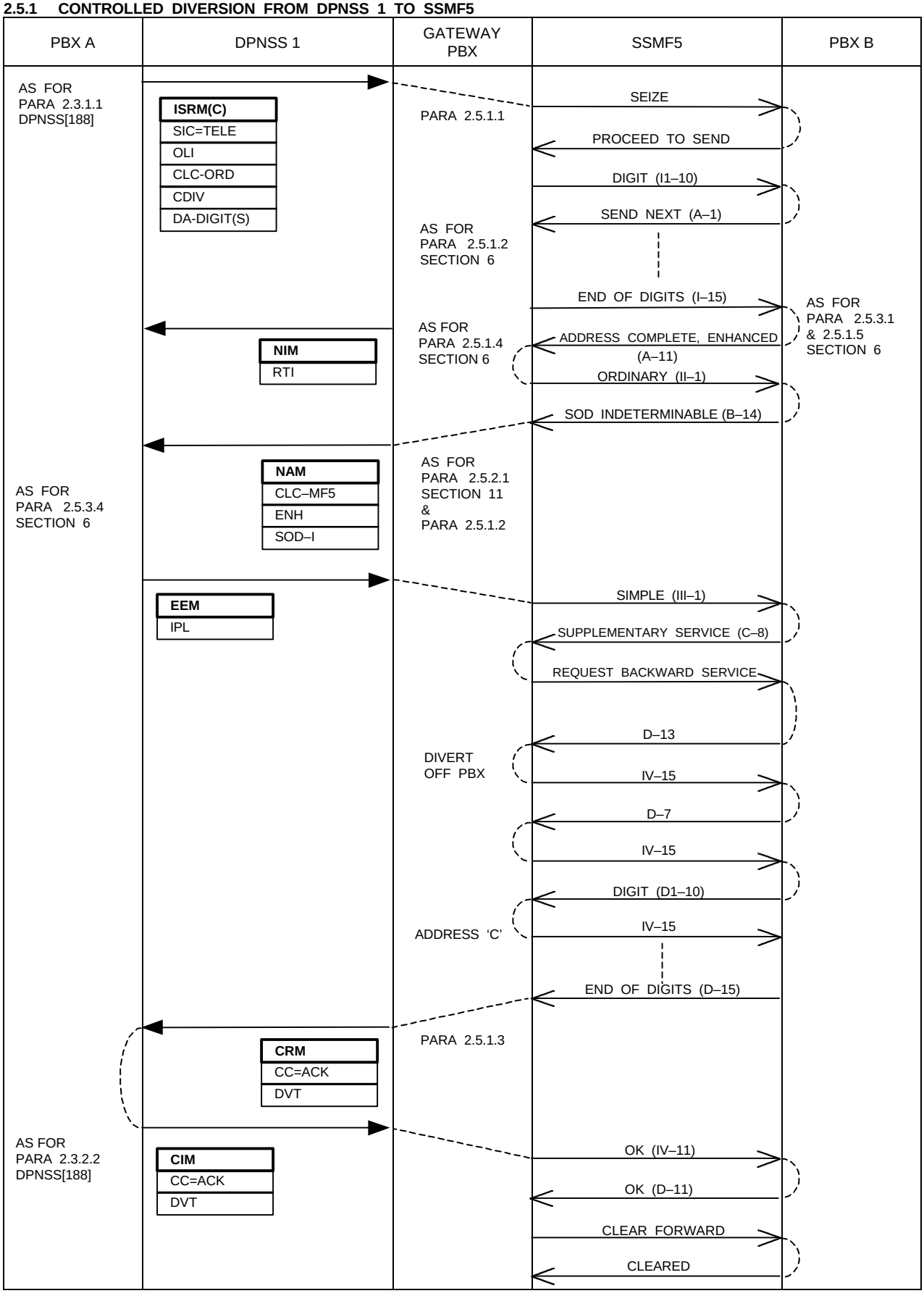
2.5 INTERWORKING WITH SSMF5 (SSMF5 Diversion Supplementary Service Supported)

Although the Controlled Diversion Supplementary Service is not specified in SSMF5 the Supplementary Service may be provided by a Gateway PBX if it supports the SSMF5 Diversion Supplementary Service. This paragraph details the requirements for interworking between DPNSS 1 and SSMF5 when the Gateway PBX supports Controlled Diversion for DPNSS 1 and Diversion for SSMF5. The Supplementary Service is only available on calls from DPNSS 1 to SSMF5.

OUTLINE OF OPERATION

Interworking between the DPNSS 1 Controlled Diversion Supplementary Service and the SSMF5 Diversion Supplementary Service is provided by the following signalling sequence:

2.5.1 CONTROLLED DIVERSION FROM DPNSS 1 TO SSMF5



2.5.1.1 As for SECTION 11 Paragraph 2.5.2.1. The Controlled Diversion Request String (CDIV) does not have any effect on the establishment of the SSMF5 call until receipt of the SSMF5 signal D-15.

2.5.1.2 If any other SOD signal is received, the Gateway shall allow the call to proceed as a Simple Call as described in SECTION 6, Paragraph 2.5.3. The CDIV string shall be discarded by the Gateway PBX.

2.5.1.3 On receipt of the SSMF5 Signal D-15 the Gateway shall clear the SSMF5 call and send a CRM with Clearing Cause: ACK together with String DVT (the Parameter of which shall be the address to divert to). A CIM shall be expected in response.

2.6 INTERWORKING WITH SSMF5 (SSMF5 Diversion Supplementary Service not Supported)

If a PBX acting as a Gateway to an SSMF5 network that does not support Diversion receives an ISRM containing CDIV it shall allow the call to continue as for a Simple Call in accordance with SECTION 6, Paragraph 2.5.1 (Basic) or 2.5.3 (Enhanced).

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 22 - SUPPLEMENTARY SERVICE : REDIRECTION

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2.5 SSMF5 (SSMF5 Diversion Supplementary Service supported) .....Page 4

2.6 SSMF5 (SSMF5 Diversion Supplementary Service not Supported) .....Page 5

HISTORY

Issue 1 - May 1985
Issue 2 - March 1988

Issue 3 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Redirection Supplementary Service.

1.2 Subsection 2 details the Redirection Supplementary Service when DPNSS 1 interworks with the other signalling systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide the Redirection Supplementary Service, there is no special PSTN signalling involved.

However, a PSTN Gateway PBX may participate in the Supplementary Service as follows:

2.1.1 If a PBX, acting as a Gateway to the PSTN, receives a Redirecting Call (an ISRM or RM containing Strings RDG and DVG-R) it shall handle the call as specified for Divert on No-Reply (DVG-R) in SECTION 11, Paragraph 2.1.1. The RDG String shall be discarded by the Gateway PBX.

2.1.2 If a PBX, acting as a Gateway to the PSTN, receives a Redirecting on Call Failure Call (an ISRM or RM containing String RCF) it shall handle the call as specified for Divert Immediate (DVG-I) in SECTION 11, Paragraph 2.1.1.

2.1.3 A PSTN Gateway PBX may initiate the Redirection Supplementary Service if an incoming call encounters failure in the DPNSS 1 network or fails to progress to the connected state. The procedures of DPNSS[188] SECTION 22 shall apply, with the Gateway PBX acting as the Originating PBX. CLC-PSTN shall replace CLC-ORD in the ISRM or RM.

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide the Redirection Supplementary Service there is no special DASS 2 signalling involved.

However, a DASS 2 Gateway PBX may participate in the Supplementary Service as follows:

2.2.1 If a PBX, acting as a Gateway to DASS 2, receives a Redirecting Call (an ISRM or RM containing Strings RDG and DVG-R) it shall handle the call as specified for Divert on No-Reply (DVG-R) in SECTION 11, Paragraph 2.2.1. The RDG String shall be discarded by the Gateway PBX.

2.2.2 If a PBX, acting as a Gateway to DASS 2, receives a Redirecting on Call Failure Call (an ISRM or RM containing String RCF) it shall handle the call as specified for Divert Immediate (DVG-I) in SECTION 11, Paragraph 2.2.1.

2.2.3 A DASS 2 Gateway PBX may initiate the Redirection Supplementary Service if an incoming call encounters failure in the DPNSS 1 network or fails to progress to the connected state. The procedures of DPNSS[188] SECTION 22 shall apply, with the Gateway PBX acting as the Originating PBX. CLC-ISDN shall replace CLC-ORD in the ISRM or RM.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

As a Decadic route does not provide the Redirection Supplementary Service, there is no Decadic signalling involved.

However, a Decadic Gateway PBX may participate in the Supplementary Service as follows:

2.4.1 If a PBX, acting as a Gateway to Decadic, receives a Redirecting Call (an ISRM or RM containing Strings RDG and DVG-R) it shall handle the call as specified for Divert on No-Reply (DVG-R) in SECTION 11, Paragraph 2.4.1. The RDG String shall be discarded by the Gateway PBX.

2.4.2 If a PBX, acting as a Gateway to Decadic, receives a Redirecting on Call Failure Call (an ISRM or RM containing String RCF) it shall handle the call as specified for Divert Immediate (DVG-I) in SECTION 11, Paragraph 2.4.1.

2.4.3 A Decadic Gateway PBX may initiate the Redirection Service if an incoming call encounters failure in the DPNSS 1 network or fails to progress to the connected state. The procedures of DPNSS[188] SECTION 22 shall apply, with the Gateway PBX acting as the Originating PBX. CLC-DEC shall replace CLC-ORD in the ISRM or RM.

2.5 INTERWORKING WITH SSMF5 (SSMF5 Diversion Supplementary Service Supported)

Although the Redirection Supplementary Service is not specified in SSMF5 the Supplementary Service may be provided by a Gateway PBX if it supports the SSMF5 Diversion Supplementary Service. This paragraph details the requirements for interworking between DPNSS 1 and SSMF5 when the Gateway PBX supports Redirection for DPNSS 1 and Diversion for SSMF5.

2.5.1 If a PBX, acting as a Gateway to SSMF5, receives a Redirecting Call (an ISRM or RM containing Strings RDG and DVG-R) it shall handle the call as specified for Divert on No-Reply (DVG-R) in SECTION 11, Paragraph 2.5.3. The RDG String shall be discarded by the Gateway PBX.

2.5.2 If a PBX, acting as a Gateway to SSMF5, receives a Redirecting on Call Failure Call (an ISRM or RM containing String RCF) it shall handle the call as specified for Divert Immediate (DVG-I) in SECTION 11, Paragraph 2.5.3.

2.5.3 An SSMF5 Gateway PBX may initiate the Redirection Supplementary Service if an incoming call encounters failure in the DPNSS 1 network or fails to progress to the connected state. The procedures of DPNSS[188] SECTION 22 shall apply, with the Gateway PBX acting as the Originating PBX. CLC-MF5 shall replace CLC-ORD in the ISRM or RM. There is no additional SSMF5 signalling involved.

2.6 INTERWORKING WITH SSMF5 (SSMF5 Diversion Supplementary Service not Supported)

This paragraph details the requirements for interworking between DPNSS 1 and SSMF5 when the Gateway PBX supports SSMF5 but not the SSMF5 Diversion Supplementary Service.

2.6.1 If a PBX, acting as a Gateway to SSMF5, receives a Redirecting Call (an ISRM or RM containing Strings RDG and DVG-R) it shall handle the call as specified for Divert on No-Reply (DVG-R) in SECTION 11, Paragraph 2.6.1.

2.6.2 If a PBX, acting as a Gateway to SSMF5, receives a Redirecting on Call Failure Call (an ISRM or RM containing String RCF) it shall handle the call as specified for Divert Immediate (DVG-I) in SECTION 11, Paragraph 2.6.1.

2.6.3 An SSMF5 Gateway PBX may initiate the Redirection Supplementary Service if an incoming call encounters failure in the DPNSS 1 network or fails to progress to the connected state. The procedures of DPNSS[188] SECTION 22 shall apply, with the Gateway PBX acting as the Originating PBX. CLC-MF5 shall replace CLC-ORD in the ISRM or RM. There is no additional SSMF5 signalling involved.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 23 - SUPPLEMENTARY SERVICE : SERIES CALL

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2.5 SSMF5 .....Page 4

HISTORY

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REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Series Call Supplementary Service.

1.2 Subsection 2 details the Series Call Supplementary Service when DPNSS 1 interworks with other signalling systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide the Series Call Supplementary Service there is no special PSTN signalling involved.

However, if a PBX acting as a Gateway from the PSTN receives a Series Call Request (an EEM containing String SER-R) from the assistance point, then the procedures as detailed in DPNSS[188] SECTION 23 shall apply, with the Gateway PBX acting as the Originating PBX.

If a Gateway PBX receives an ISRM containing String SER-E the call shall be allowed to proceed as if a Simple Telephony Call had been requested. The procedures shown in SECTION 6, Paragraph 2.1.1 shall be followed.

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide the Series Call Supplementary Service there is no special DASS 2 signalling involved.

However, if a PBX acting as a Gateway from DASS 2 receives a Series Call Request (an EEM containing String SER-R) from the assistance point, then the procedures as detailed in DPNSS[188] SECTION 23 shall apply, with the Gateway PBX acting as the Originating PBX.

If a Gateway PBX receives an ISRM containing String SER-E the call shall be allowed to proceed as if a Simple Telephony Call had been requested. The procedures shown in SECTION 6, Paragraph 2.2.1 shall be followed.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

As a Decadic route does not provide the Series Call Supplementary Service there is no special Decadic signalling involved.

However, if a PBX acting as a Gateway from a Decadic route receives a Series Call Request (an EEM containing String SER-R) from the assistance point, then the procedures as detailed in DPNSS[188] SECTION 23 shall apply, with the Gateway PBX acting as the Originating PBX.

If a Gateway PBX receives an ISRM containing String SER-E the call shall be allowed to proceed as if a Simple Telephony Call had been requested. The procedures shown in SECTION 6, Paragraph 2.4.1 shall be followed.

2.5 INTERWORKING WITH SSMF5

As SSMF5 does not provide the Series Call Supplementary Service there is no special SSMF5 signalling involved.

However, if a PBX acting as a Gateway from an SSMF5 route receives a Series Call Request (an EEM containing String SER-R) from the assistance point, then the procedures as detailed in DPNSS[188] SECTION 23 shall apply, with the Gateway PBX acting as the Originating PBX.

If a Gateway PBX receives an ISRM containing String SER-E the call shall be allowed to proceed as if a Simple Telephony Call had been requested. The procedures shown in SECTION 6, Paragraph 2.5.1 shall be followed.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 24 - SUPPLEMENTARY SERVICE : THREE PARTY TAKEOVER

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HISTORY

Issue 1 - May 1985
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REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Three Party Takeover Supplementary Service.

1.2 Subsection 2 details the Three Party Takeover Supplementary Service when DPNSS 1 interworks with other signalling systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide the Three Party Takeover Supplementary Service, there is no PSTN signalling involved.

Note that a DPNSS 1 extension may make an enquiry call whilst holding a call to or from the PSTN, and the called party may request Takeover. As a result the PSTN Gateway will receive a Transfer Notification (an EEM containing String TRFD). The Gateway shall then behave as detailed in SECTION 13 Paragraph 2.1.

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide the Three Party Takeover Supplementary Service, there is no DASS 2 signalling involved.

Note that a DPNSS 1 extension may make an enquiry call whilst holding a call to or from DASS 2, and the called party may request Takeover. As a result the DASS 2 Gateway will receive a Transfer Notification (an EEM containing String TRFD). The Gateway shall then behave as detailed in SECTION 13 Paragraph 2.2.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED.

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

As a Decadic route does not provide the Three Party Takeover Supplementary Service, there is no Decadic signalling involved.

Note that a DPNSS 1 extension may make an enquiry call whilst holding a call to or from a Decadic route, and the called party may request Takeover. As a result the Decadic Gateway will receive a Transfer Notification (an EEM containing String TRFD). The Gateway shall then behave as detailed in SECTION 13 Paragraph 2.4.

2.5 INTERWORKING WITH SSMF5

As SSMF5 does not provide the Three Party Takeover Supplementary Service, there is no SSMF5 signalling involved.

Note that a DPNSS 1 extension may make an enquiry call whilst holding a call to or from an SSMF5 route, and the called party may request takeover. As a result the SSMF5 Gateway will receive a Transfer Notification (an EEM containing String TRFD). The Gateway shall then behave as detailed in SECTION 13 Paragraph 2.5.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 25 - SUPPLEMENTARY SERVICE : NIGHT SERVICE

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HISTORY

Issue 1 - May 1985
Issue 2 - March 1988

Issue 3 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for Night Service.

1.2 Subsection 2 details Night Service, when DPNSS 1 interworks with other signalling systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide Night Service, there is no special PSTN signalling involved.

However, a PSTN Gateway PBX may participate in the service as follows.

2.1.1 If a PBX acting as a Gateway to the PSTN, receives a Night Service Diverting call (an ISRM or RM containing NS-DVG and DVG-R) it shall handle the call as specified for Divert on No-Reply (DVG-R) in SECTION 11 Paragraph 2.1.1. The NS-DVG String is discarded by the Gateway PBX.

2.1.2 If a Night Service Rediverting Call (an ISRM or RM containing NS-RDVG) encounters a PSTN Gateway, and there is no other suitable route the call shall be rejected by sending a CRM containing the Clearing Cause: SSI and (optionally) CLC-PSTN. A CIM is expected in response.

2.1.3 An incoming call from the PSTN (or a transferred PSTN call) may encounter an operator group position in Night Mode. The procedures in DPNSS[188] SECTION 25, Paragraphs 2.3.2, 2.3.3 and 2.3.4 (Diversion) and 2.3.5, 2.3.6 and 2.3.7 (Rediversion) apply, with the Gateway PBX acting as the DPNSS 1 Originating PBX. CLC-PSTN replaces CLC-ORD in the ISRM or RM.

2.1.4 If a Night Service Notification call (an ISRM containing NS-N) encounters a PSTN Gateway and there is no other suitable route the call shall be rejected by returning a CRM containing the Clearing Cause: SSI and (optionally) CLC-PSTN. A CIM is expected in response.

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide Night Service there is no special DASS 2 signalling involved.

However, a DASS 2 Gateway PBX may participate in the service as follows:

2.2.1 If a PBX acting as a Gateway to DASS 2, receives a Night Service Diverting call (an ISRM or RM containing NS-DVG and DVG-R) it shall handle the call as specified for Divert on No-Reply (DVG-R) in SECTION 11 Paragraph 2.2.1. The NS-DVG String is discarded by the Gateway PBX.

2.2.2 If a Night Service Rediverting call (an ISRM or RM containing NS-RDVG) encounters a DASS 2 Gateway, and there is no other suitable route, the call shall be rejected by returning a CRM containing the Clearing Cause: SSI and (optionally) CLC-ISDN. A CIM is expected in response.

2.2.3 An incoming call from DASS 2 (or a transferred DASS 2 call) may encounter an operator group position in Night Mode. The procedures in DPNSS[188] SECTION 25, Paragraphs 2.3.2, 2.3.3 and 2.3.4 (Diversion) and 2.3.5, 2.3.6 and 2.3.7 (Rediversion) apply, with the Gateway PBX acting as the DPNSS 1 Originating PBX. CLC-ISDN replaces CLC-ORD in the ISRM or RM.

2.2.4 If a Night Service Notification call (an ISRM containing NS-N) encounters a DASS 2 Gateway and there is no other suitable route the call shall be rejected by returning a CRM containing the Clearing Cause: SSI and (optionally) CLC-ISDN. A CIM is expected in response.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED.

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

As a Decadic route does not provide Night Service, there is no Decadic signalling involved.

However, a Decadic Gateway PBX may participate in the service as follows:

2.4.1 If a PBX acting as a Gateway to Decadic, receives a Night Service Diverting call (an ISRM or RM containing NS-DVG and DVG-R) it shall handle the call as specified for Divert on No-Reply (DVG-R) in SECTION 11 Paragraph 2.4.1. The NS-DVG String is discarded by the Gateway PBX.

2.4.2 If a Night Service Rediverting call request (an ISRM or RM containing NS-RDVG) encounters a Decadic Gateway, and there is no other suitable route, the call shall be rejected by returning a CRM containing the Clearing Cause: SSI and (optionally) CLC-DEC. A CIM is expected in response.

2.4.3 An incoming call from Decadic (or a transferred outgoing Decadic call) may encounter an operator group position in Night Mode. The procedures in DPNSS[188] SECTION 25, Paragraphs 2.3.2, 2.3.3 and 2.3.4 (Diversion) and 2.3.5, 2.3.6 and 2.3.7 (Rediversion) apply, with the Gateway PBX acting as the DPNSS 1 Originating PBX. CLC-DEC replaces CLC-ORD in the ISRM or RM.

2.4.4 If a Night Service Notification call (an ISRM containing NS-N) encounters a Decadic Gateway and there is no other suitable route the call shall be rejected by returning a CRM Containing the Clearing Cause: SSI and (optionally) CLC-DEC. A CIM is expected in response.

2.5 INTERWORKING WITH SSMF5 (SSMF5 Diversion Supplementary Service Supported)

Although Night Service is not specified in SSMF5 the service may be provided by a Gateway PBX if it supports the SSMF5 Diversion Supplementary Service. This paragraph details the requirements for interworking between DPNSS 1 and SSMF5 when the Gateway PBX supports Night Service for DPNSS 1 and Diversion for SSMF5.

2.5.1 If a PBX acting as a Gateway to SSMF5, receives a Night Service Diverting call (an ISRM or RM containing NS-DVG and DVG-R) it shall handle the call as specified for Divert on No-Reply (DVG-R) in SECTION 11 Paragraph 2.5.3. The NS-DVG String is discarded by the Gateway PBX.

2.5.2 If a Night Service Rediverting call (an ISRM or RM containing NS-RDVG) encounters an SSMF5 Gateway, and there is no other suitable route, the call shall be rejected by returning a CRM containing the Clearing Cause: SSI and (optionally) CLC-MF5. A CIM is expected in response.

2.5.3 An incoming call from SSMF5 (or a transferred outgoing SSMF5 call) may encounter an operator group position in Night Mode. The procedures in DPNSS[188] SECTION 25, Paragraphs 2.3.2, 2.3.3 and 2.3.4 (Diversion) and 2.3.5, 2.3.6 and 2.3.7 (Rediversion) apply, with the Gateway PBX acting as the DPNSS 1 Originating PBX. CLC-MF5 replaces CLC-ORD in the ISRM or RM.

2.5.4 If a Night Service Notification call (an ISRM containing NS-N) encounters an SSMF5 Gateway and there is no other suitable route the call shall be rejected by returning a CRM containing the Clearing Cause: SSI and (optionally) CLC-MF5. A CIM is expected in response.

2.6 INTERWORKING WITH SSMF5 (SSMF5 Diversion Supplementary Service not Supported)

This paragraph details the requirements for interworking between DPNSS 1 and SSMF5 when the Gateway PBX supports SSMF5 but not the SSMF5 Diversion Supplementary Service.

2.6.1 If a PBX acting as a Gateway to SSMF5, receives a Night Service Diverting call (an ISRM or RM containing NS-DVG and DVG-R) it shall handle the call as specified for Divert on No-Reply (DVG-R) in SECTION 11 paragraph 2.6.3.

2.6.2 If a Night Service Rediverting call request (an ISRM or RM containing NS-RDVG) encounters an SSMF5 Gateway, and there is no other suitable route, the call shall be rejected by returning a CRM containing the Clearing Cause: SSI and (optionally) CLC-MF5. A CIM is expected in response.

2.6.3 An incoming call from SSMF5 (or a transferred outgoing SSMF5 call) may encounter an operator group position in Night Mode. The procedures in DPNSS[188] SECTION 25, paragraphs 2.3.2, 2.3.3 and 2.3.4 (Diversion) and 2.3.5, 2.3.6 and 2.3.7 (Rediversion) apply, with the Gateway PBX acting as the DPNSS 1 Originating PBX. CLC-MF5 replaces CLC-ORD in the ISRM or RM.

2.6.4 If a Night Service Notification call (an ISRM containing NS-N) encounters an SSMF5 Gateway and there is no other suitable route the call shall be rejected by returning a CRM containing the Clearing Cause: SSI and (optionally) CLC-MF5. A CIM is expected in response.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 26 - SUPPLEMENTARY SERVICE : CENTRALISED OPERATOR

GENERAL

The DPNSS 1 Centralised Operator Service comprises a collection of DPNSS 1 Supplementary Services (see SECTION 26 of DPNSS[188]) which in combination provide the facilities required by an Operator in a Private Network that supports DPNSS 1. The interworking requirements for each of the Supplementary Services listed in SECTION 26 of DPNSS[188] is given in the appropriate Sections of this specification.

HISTORY

Issue 1 - May 1985
Issue 2 - March 1988

Issue 3 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 27 - SUPPLEMENTARY SERVICE : TRAFFIC CHANNEL MAINTENANCE

INTERWORKING OF THIS SERVICE IS NOT APPLICABLE

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 28 - SUPPLEMENTARY SERVICE : REMOTE ALARM REPORTING

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2.4 DECADIC PRIVATE CIRCUIT .....Page 3

2.5 SSMF5 .....Page 3

HISTORY

Issue 1 - March 1988

Issue 2 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Remote Alarm Reporting Supplementary Service.

1.2 Subsection 2 details the Remote Alarm Reporting Supplementary Service when DPNSS 1 interworks with other signalling systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide the Remote Alarm Reporting Supplementary Service, there is no PSTN signalling involved.

However, if a PBX acting as a Gateway to the PSTN receives a Remote Alarm Request (an ISRM containing AS-R) it shall respond with a Clear Request Message (CRM) containing the Clearing Cause: SSI and optionally CLC-PSTN. A CIM is expected in response.

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide the Remote Alarm Reporting Supplementary Service, there is no DASS 2 signalling involved.

However, if a PBX acting as a Gateway to DASS 2 receives a Remote Alarm Request (an ISRM containing AS-R) it shall respond with a Clear Request Message (CRM) containing the Clearing Cause: SSI and optionally CLC-ISDN. A CIM is expected in response.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

As a Decadic Route does not provide the Remote Alarm Reporting Supplementary Service, there is no Decadic signalling involved.

However, if a PBX acting as a Gateway to a Decadic Private Circuit receives a Remote Alarm Request (an ISRM containing AS-R) it shall respond with a Clear Request Message (CRM) containing the Clearing Cause: SSI and optionally CLC-DEC. A CIM is expected in response.

2.5 INTERWORKING WITH SSMF5

As SSMF5 does not provide the Remote Alarm Reporting Supplementary Service, there is no SSMF5 signalling involved.

However, if a PBX acting as a Gateway to SSMF5 receives a Remote Alarm Request (an ISRM containing AS-R) it shall respond with a Clear Request Message (CRM) containing the Clearing Cause: SSI and optionally CLC-MF5. A CIM is expected in response.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 29 - SUPPLEMENTARY SERVICE : ADD-ON CONFERENCE

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HISTORY

Issue 1 - March 1988

Issue 2 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Add-On Conference Supplementary Service.

1.2 Subsection 2 details the Add-On Conference Supplementary Service when DPNSS 1 interworks with other signalling systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide the Add-On Conference Supplementary Service, there is no PSTN signalling involved. However, a PSTN Gateway PBX may participate in the service as follows:

2.1.1 If an ISRM containing the String ENQ is received at a PSTN Gateway then the ENQ String shall be discarded and the PSTN call shall proceed as for a Simple Telephony Call.

Once the Enquiry Call is established, the Gateway PBX shall behave as a Non-Controlling PBX for the purpose of acting upon End to End Messages relating to the Add-On Conference Supplementary Service.

2.1.2 On receipt of an EEM containing an Add-on-Validation Request (AD-V) the Gateway PBX must respond with an EEM containing ACK and CLC-PSTN (CLI is optional), or, if Add-On is not permitted, Reject (REJ).

2.1.3 EEMs containing TWP must be checked as they will contain CLCs which may be used to check compliance with the regulatory rules of the country concerned.

2.1.4 EEMs containing Add-On (AD-O) may be ignored.

The Controlling PBX shall not attempt any action which would result in a connection which is not permitted, nor shall it attempt any action which would result in a connection which could not be cleared because of the inability of either party to generate a Release signal.

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide the Add-On Conference Supplementary Service, there is no DASS 2 signalling involved.

However, a DASS 2 Gateway PBX may participate in the service as follows:

2.2.1 If an ISRM containing the String ENQ is received at a DASS 2 Gateway the String shall be discarded and the DASS 2 call shall proceed as for a Simple Telephony Call.

Once the Enquiry Call is established, the Gateway PBX shall behave as a Non-Controlling PBX for the purpose of acting upon End to End Messages relating to the Add-On Conference Supplementary Service.

2.2.2 On receipt of an EEM containing an Add-On Validation Request (AD-V) the Gateway PBX must respond with an EEM containing ACK and CLC-ISDN (CLI is optional), or, if Add-On is not permitted, REJ.

2.2.3 EEMs containing TWP must be checked as they will contain CLCs which may be used to check compliance with the regulatory rules of the country concerned.

2.2.4 EEMs containing Add-On (AD-O) may be ignored.

The Controlling PBX shall not attempt any action which would result in a connection which is not permitted, nor shall it attempt any action which would result in a connection which could not be cleared because of the inability of either party to generate a Release signal.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED

2.4 INTERWORKING WITH DECADIC PRIVATE CIRCUIT

As a Decadic route does not provide the Add-On Conference Supplementary Service, there is no Decadic signalling involved.

However, a Decadic Gateway PBX may participate in the service as follows:

2.4.1 If an ISRM containing the String ENQ is received at a Decadic Gateway the ENQ String shall be discarded and the Decadic call shall proceed as for a Simple Telephony Call.

Once the Enquiry Call is established, the Gateway PBX shall behave as a Non-Controlling PBX for the purpose of acting upon End to End Messages relating to the Add-On Conference Supplementary Service.

2.4.2 On receipt of an EEM containing an Add-On Validation Request (AD-V) the Gateway PBX must respond with an EEM containing ACK and CLC-DEC (CLI is optional), or, if Add-On is not permitted, REJ.

2.4.3 EEMs containing TWP must be checked as they will contain CLCs which may be used to check compliance with the regulatory rules of the country concerned.

2.4.4 EEMs containing Add-On (AD-O) may be ignored.

The Controlling PBX shall not attempt any action which would result in a connection which is not permitted, nor shall it attempt any action which would result in a connection which

could not be cleared because of the inability of either party to generate a Release signal.

2.5 INTERWORKING WITH SSMF5

As SSMF5 does not provide the Add-On Conference Supplementary Service, there is no SSMF5 signalling involved.

However, a SSMF5 Gateway PBX may participate in the service as follows:

2.5.1 If an ISRM containing the String ENQ is received at a SSMF5 Gateway, the ENQ String shall be discarded and the SSMF5 call shall proceed as for a Simple Telephony Call.

Once the Enquiry Call is established, the Gateway PBX shall behave as an Non-Controlling PBX for the purpose of acting upon End to End Messages relating to the Add-On Conference Supplementary Service.

2.5.2 On receipt of an EEM containing an Add-On Validation Request (AD-V) the Gateway PBX must respond with an EEM containing ACK and CLC-SSMF5 (CLI is optional), or, if Add-On is not permitted, REJ.

2.5.3 EEMs containing TWP must be checked as they will contain CLCs which may be used to check compliance with the regulatory rules of the country concerned.

2.5.4 EEMs containing Add-On (AD-O) may be ignored.

The Controlling PBX shall not attempt any action which would result in a connection which is not permitted, nor shall it attempt any action which would result in a connection which could not be cleared because of the inability of either party to generate a Release signal.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 30 - SUPPLEMENTARY SERVICE : TIME SYNCHRONISATION

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HISTORY

Issue 1 - March 1988

Issue 2 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Time Sychronisation Supplementary Service.

1.2 Subsection 2 details the Time Synchronisation Supplementary Service when DPNSS 1 interworks with other signalling systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide the Time Synchronisation Supplementary Service there is no PSTN signalling involved.

However, if a PBX acting as a Gateway to the PSTN, receives a Time and Date Request (an ISRM containing TAD-R) or it receives a Time and Date Notification (an ISRM containing TAD) it shall respond with a Clear Request Message (CRM) containing the Clearing Cause: SSI and optionally CLC-PSTN. A CIM is expected in response.

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide the Time Synchronisation Supplementary Service, there is no DASS 2 signalling involved.

However, if a PBX acting as a Gateway to DASS 2, receives a Time and Date Request (an ISRM containing TAD-R) or it receives a Time and Date Notification (an ISRM containing TAD) it shall respond with a Clear Request Message (CRM) containing the Clearing Cause: SSI and optionally CLC-ISDN. A CIM is expected in response.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

As a Decadic Route does not provide the Time Synchronisation Supplementary Service there is no Decadic signalling involved.

However, if a PBX acting as a Gateway to a Decadic Private Circuit receives a Time and Date Request (an ISRM containing TAD-R) or it receives a Time and Date Notification (an ISRM containing TAD) it shall respond with a Clear Request Message (CRM) containing the Clearing Cause: SSI and optionally CLC-DEC. A CIM is expected in response.

2.5 INTERWORKING WITH SSMF5

As SSMF5 does not provide the time Synchronisation Supplementary Service, there is no SSMF5 signalling involved.

However, if a PBX acting as a Gateway to SSMF5, receives a Time and Date Request (an ISRM containing TAD-R) or it receives a Time and Date Notification (an ISRM containing TAD) it shall respond with a Clear Request Message (CRM) containing the Clearing Cause: SSI and optionally CLC-MF5. A CIM is expected in response.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 31 - SUPPLEMENTARY SERVICE : CALL BACK WHEN NEXT USED

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2.5 SSMF5 (SSMF5 CALL BACK SUPPLEMENTARY SERVICE SUPPORTED) .....Page 4

2.6 SSMF5 (SSMF5 CALL BACK SUPPLEMENTARY SERVICE NOT SUPPORTED) .....Page 4

HISTORY

Issue 1 - March 1988

Issue 2 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Call Back When Next Used Supplementary Service.

1.2 Subsection 2 details the Call Back When Next Used Supplementary Service when DPNSS 1 interworks with other signalling systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide the Call Back When Next Used Supplementary Service, there is no PSTN signalling involved.

2.1.1 A DPNSS 1 extension involved in a call to a PSTN customer (eg receiving ring tone) will have a Call Back When Next Used request rejected by the Originating PBX.

2.1.2 If a PBX acting as a Gateway to the PSTN receives an ISRM containing CBWNU-R then the call should be rejected by sending a CRM containing Clearing Cause: SSI and optionally CLC-PSTN. A CIM will be expected in response.

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide the Call Back When Next Used Supplementary Service, there is no DASS 2 signalling involved.

2.2.1 A DPNSS 1 extension involved in a call to a DASS 2 customer (eg receiving ring tone) will have a Call Back When Next Used request rejected by the Originating PBX.

2.2.2 If a PBX acting as a Gateway to DASS 2 receives an ISRM containing CBWNU-R then the call should be rejected by sending a CRM containing Clearing Cause: SSI and optionally, CLC-ISDN. A CIM will be expected in response.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

As a Decadic route does not provide the Call Back When Next Used Supplementary Service, there is no Decadic Signalling involved.

2.4.1 A DPNSS 1 extension involved in a call to a Decadic extension (eg receiving ring tone) will have a Call Back When Next Used request rejected by the Originating PBX.

2.4.2 If a PBX acting as a Gateway to Decadic receives an ISRM containing CBWNU-R then the call should be rejected by sending a CRM containing Clearing Cause: SSI and optionally CLC-DEC. A CIM will be expected in response.

2.5 INTERWORKING WITH SSMF5 (SSMF5 CALL BACK SUPPLEMENTARY SERVICE SUPPORTED)

Call Back is an optional Supplementary Service in SSMF5. This paragraph details the requirements for interworking between DPNSS 1 and SSMF5 when the Gateway PBX supports the DPNSS 1 Call Back When Next Used Supplementary Service and the SSMF5 Call Back Supplementary Service.

This Supplementary Service is provided in the same way as Call Back When Free (see SECTION 9 of this specification), with the following exceptions.

2.5.1 Paragraph 2.5.1.2 should refer to the Call Back When Next Used Service and send CBWNU-R in place of CBWF-R.

2.5.2 Paragraph 2.5.1.3 should refer to CBWNU-R in place of CBWF-R, taking the same action as for Call Back When Free.

2.5.3 Paragraph 2.5.5.2 should read: when the Gateway PBX receives the SSMF5 End of Digits Signal after Free Notification Request and after a successful call set up, it sends an ISRM containing the OLI, CBWNU-R and CLC-MF5 on a Virtual Channel.

2.6 INTERWORKING WITH SSMF5 (SSMF5 CALL BACK SUPPLEMENTARY SERVICE NOT SUPPORTED)

Call Back is an optional Supplementary Service in SSMF5. This paragraph details the requirements for interworking between DPNSS 1 and SSMF5 when the Gateway PBX does not support the SSMF5 Call Back Supplementary Service.

2.6.1 A DPNSS 1 extension involved in a call to SSMF5 Basic extension (eg receiving ring tone) will have a Call Back When Next request rejected by the Originating PBX.

2.6.2 If a PBX acting as a Gateway to SSMF5 receives an ISRM containing CBWNU-R then the call should be rejected by sending a CRM containing Clearing Cause: SU and optionally CLC-MFS. A CIM will be expected in response.

2.6.3 If a PBX acting as a Gateway to SSMF5 receives an EEM containing CBWNU-R then the call should be rejected by sending a CRM containing Clearing Cause: SU and optionally CLC-MF5. A CIM will be expected in response.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 32 - SUPPLEMENTARY SERVICE : DO NOT DISTURB

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HISTORY

Issue 1 - March 1988

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REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Do Not Disturb Supplementary Service.

1.2 Subsection 2 details the Do Not Disturb Supplementary Service when DPNSS 1 interworks with other Signalling Systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide the Do Not Disturb Supplementary Service, there is no special PSTN Signalling involved.

2.1.1 If a PBX acting as a Gateway to the PSTN receives a Do Not Disturb Override request (ISRM containing DND-O) the request shall be discarded and the call shall proceed as a Simple Call.

2.1.2 If a PBX acting as a Gateway from the PSTN receives a Do Not Disturb indication (CRM with Clearing Cause: BY containing DND) the indication shall be ignored for the purpose of signalling to the PSTN, but may otherwise be used by the Gateway PBX.

2.1.3 A PBX acting as a Gateway from the PSTN may automatically include a Do Not Disturb Override request (DND-O) in the ISRM.

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide the Do Not Disturb Supplementary Service there is no special DASS 2 signalling involved.

2.2.1 If a PBX acting as a Gateway to DASS 2 receives a Do Not Disturb Override request (ISRM containing DND-O) the request shall be discarded and the call shall proceed as a Simple Call.

2.2.2 If a PBX acting as a Gateway from DASS 2 receives a Do Not Disturb indication (CRM with Clearing Cause: BY containing DND) the indication shall be ignored for the purpose of signalling to DASS 2 but may otherwise be used by the Gateway PBX.

2.2.3 A PBX acting as a Gateway from DASS 2 may automatically include a Do Not Disturb Override request (DND-O) in the ISRM.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED

2.4 INTERWORKING WITH DECADIC PRIVATE CIRCUIT

As a Decadic Route does not provide the Do Not Disturb Supplementary Service there is no special Decadic signalling involved.

2.4.1 If a PBX acting as a Gateway to a Decadic route receives a Do Not Disturb Override request (ISRM containing DND-O) the request shall be discarded and the call shall proceed as a Simple Call.

2.4.2 If a PBX acting as a Gateway from a Decadic route receives a Do Not Disturb indication (CRM with Clearing Cause: BY containing DND) the indication shall be ignored for the purpose of signalling to the Decadic route, but may otherwise be used by the Gateway PBX.

2.4.3 A PBX acting as a Gateway from a Decadic route may automatically include a Do Not Disturb Override request (DND-O) in the ISRM.

2.5 INTERWORKING WITH SSMF5

As SSMF5 does not provide the Do Not Disturb Supplementary Service, there is no special SSMF5 signalling involved.

2.5.1 If a PBX acting as a Gateway to SSMF5 receives a Do Not Disturb Override request (ISRM containing DND-O) the request shall be discarded and the call shall proceed as a Simple Call.

2.5.2 If a PBX acting as a Gateway from SSMF5 receives a Do Not Disturb indication (CRM with Clearing Cause: BY containing DND) the indication shall be ignored for the purpose of signalling to the SSMF5, but may otherwise be used by the Gateway PBX.

2.5.3 A PBX acting as a Gateway from SSMF5 may automatically include a Do Not Disturb Override request (DND-O) in the ISRM.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 33 - SUPPLEMENTARY SERVICE : REMOTE REGISTRATION AND CANCELLATION OF DIVERSION

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HISTORY

Issue 1 - March 1988

Issue 2 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Remote Registration and Cancellation of Diversion Supplementary Service.

1.2 Subsection 2 details the Supplementary Service when DPNSS 1 interworks with other signalling systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of the messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide the Remote Cancellation and Registration of Diversion Supplementary Service, there is no PSTN signalling involved.

If a PBX acting as a Gateway to the PSTN receives an ISRM with any of the following strings: DIV-RSI, DIV-RSB, DIV-RSR, DIV-RCI, DIV-RCB, DIV-RCR, DIV-RCA, the call shall not be allowed to proceed. A CRM shall be returned to the Originating PBX containing Clearing Cause: SSI and optionally CLC-PSTN. A CIM shall be expected in response.

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide the Remote Cancellation and Registration of Diversion Supplementary Service, there is no DASS 2 signalling involved.

If a PBX acting as a Gateway to DASS 2 receives an ISRM with any of the following strings: DIV-RSI, DIV-RSB, DIV-RSR, DIV-RCI, DIV-RCB, DIV-RCR, DIV-RCA, the call shall not be allowed to proceed. A CRM shall be returned to the Originating PBX containing Clearing Cause: SSI and optionally CLC-ISDN. A CIM shall be expected in response.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

As a Decadic route does not provide the Remote Cancellation and Registration of Diversion Supplementary Service, there is no Decadic signalling involved.

If a PBX acting as a Gateway to a Decadic route receives an ISRM with any of the following strings: DIV-RSI, DIV-RSB, DIV-RSR, DIV-RCI, DIV-RCB, DIV-RCR, DIV-RCA, the call shall not be allowed to proceed. A CRM shall be returned to the Originating PBX containing Clearing Cause: SSI and optionally CLC-DEC. A CIM shall be expected in response.

2.5 INTERWORKING WITH SSMF5

As SSMF5 does not provide the Remote Cancellation and Registration of Diversion Supplementary Service, there is no SSMF5 signalling involved.

If a PBX acting as a Gateway to an SSMF5 route receives an ISRM with any of the following strings: DIV-RSI, DIV-RSB, DIV-RSR, DIV-RCI, DIV-RCB, DIV-RCR, DIV-RCA, the call shall not be allowed to proceed. A CRM shall be returned to the Originating PBX containing Clearing Cause: SSI and optionally CLC-MF5. A CIM shall be expected in response.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 34 - SUPPLEMENTARY SERVICE : REMOTE REGISTRATION AND CANCELLATION OF DO NOT DISTURB

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HISTORY

Issue 1 - March 1988

Issue 2 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Remote Registration and Cancellation of Do Not Disturb Supplementary Service.

1.2 Subsection 2 details the Supplementary Service when DPNSS 1 interworks with other signalling systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide the Remote Registration and Cancellation of Do Not Disturb Supplementary Service, there is no PSTN signalling involved.

If a PBX acting as a Gateway to the PSTN receives an ISRM containing either DND-S or DND-C, the call shall not be allowed to proceed. A CRM shall be returned to the Originating PBX containing Clearing Cause: SSI and optionally CLC-PSTN. A CIM shall be expected in response.

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide the Remote Registration and Cancellation of Do Not Disturb Supplementary Service, there is no DASS 2 signalling involved.

If a PBX acting as a Gateway to DASS 2 receives an ISRM containing either DND-S or DND-C, the call shall not be allowed to proceed. A CRM shall be returned to the Originating PBX containing Clearing Cause: SSI and optionally CLC-ISDN. A CIM shall be expected in response.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

As a Decadic route does not provide the Remote Registration and Cancellation of Do Not Disturb Supplementary Service, there is no Decadic signalling involved.

If a PBX acting as a Gateway to a Decadic route receives an ISRM containing either DND-S or DND-C, the call shall not be allowed to proceed. A CRM shall be returned to the Originating PBX containing Clearing Cause: SSI and optionally CLC-DEC. A CIM shall be expected in response.

2.5 INTERWORKING WITH SSMF5

As SSMF5 does not provide the Remote Registration and Cancellation of Do Not Disturb Supplementary Service, there is no SSMF5 signalling involved.

If a PBX acting as a Gateway to an SSMF5 route receives an ISRM containing either DND-S or DND-C, the call shall not be allowed to proceed. A CRM shall be returned to the Originating PBX containing Clearing Cause: SSI and optionally CLC-MF5. A CIM shall be expected in response.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 35 - SUPPLEMENTARY SERVICE : PRIORITY BREAKDOWN

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HISTORY

Issue 1 - March 1988

Issue 2 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Priority Breakdown Supplementary Service.

1.2 Subsection 2 details the Priority Breakdown Supplementary Service when DPNSS 1 interworks with other signalling systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide the Priority Breakdown Supplementary Service, there is no special PSTN signalling involved.

However PBXs may assign a Breakdown Protection Level (BPL) to a call involving a PSTN Gateway, in the manner described in DPNSS[188] Issue 4, SECTION 35, paragraphs 2.3.1 and 2.3.2, by treating the PSTN trunk as an end destination in a similar manner to the way in which an ordinary extension would be treated. Thus a call originating from the PSTN may be assigned a BPL higher than 0 by including PB-P in the ISRM/SSRM, and a call terminating at the PSTN may be assigned a BPL higher than 0 by returning an LLM containing PB-P. The string SFI may also be included in either case.

If a Priority Breakdown Request (an ISRM containing PB-R) is received with a Destination Address which indicates a PSTN route and a free circuit is not available, the Gateway PBX must decide (taking into account any regulatory considerations) if any current PSTN calls can be broken down to make way for the requesting call, and if there is more than one, which one to break down.

If no existing PSTN call can be broken down to make way for the requesting call, that call should be cleared with a CRM containing Clearing Cause: CON.

If an existing PSTN call can be broken down, then a clear signal should be sent on the selected PSTN circuit and appropriate clearing action performed on behalf of the other party or parties which were involved in the call. If this results in the clearing of any DPNSS 1 channel, then the Clearing Cause: PFR should be used.

On completion of PSTN signalling to idle the circuit, or in the event of another one becoming free in the meantime, the call may proceed by seizing the free circuit on behalf of the requesting call upon which it becomes a simple DPNSS 1 to PSTN call. A NIM indicating PSTN encountered should be returned and signalling continued as described in SECTION 6 of this specification.

If the PSTN circuit fails to complete the clear within an appropriate time period, or call collision should occur on the outgoing PSTN circuit, the Gateway PBX may attempt to retry by breaking down another PSTN call. A PBX should limit the number of such retries attempted, and if this limit is reached, then the requesting call should be cleared with a CRM containing Clearing Cause: CON.

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide the Priority Breakdown Supplementary Service, there is no special DASS 2 signalling involved.

However, PBXs may assign a Breakdown Protection Level (BPL) to a call involving a DASS 2 Gateway, in the manner described in DPNSS[188], SECTION 35, paragraphs 2.3.1 and 2.3.2, by treating the DASS 2 channel as an end destination in a similar manner to the way in which an ordinary extension would be treated. Thus a call originating from DASS 2 may be assigned a BPL higher than 0 by including PB-P in the ISRM/SSRM, and a call terminating at DASS 2 may be assigned a BPL higher than 0 by returning an LLM containing PB-P. The string SFI may also be included in either case.

If a Priority Breakdown Request (an ISRM containing PB-R) is received with a Destination Address which indicates a DASS 2 route and a free channel is not available, the Gateway PBX must decide (taking into account any regulatory considerations) if any current DASS 2 calls can be broken down to make way for the requesting call, and if there is more than one, which one to break down.

If no existing DASS 2 call can be broken down to make way for the requesting call, that call should be cleared with a CRM containing Clearing Cause: CON.

If an existing DASS 2 call can be broken down, then a DASS 2 CRM with Clearing Cause: SCT should be sent on the selected DASS 2 channel and appropriate clearing action performed on behalf of the other party or parties which were involved in the call. If this results in the clearing of any DPNSS 1 channel, then the Clearing Cause: PFR should be used.

On completion of DASS 2 signalling to idle the channel, or in the event on another one becoming free in the meantime, the call may proceed by seizing the free channel on behalf of the requesting call upon which it becomes a simple DPNSS 1 to DASS 2 call. A NIM indicating public ISDN encountered should be returned and signalling continued as described in SECTION 6 of this specification.

If the DASS 2 channel fails to complete the clear within an appropriate time period, or call collision should occur on the outgoing DASS 2 channel, the Gateway PBX may attempt to retry by breaking down another DASS 2 call. A PBX should limit the number of such retries attempted, and if this limit is reached, then the requesting call should be cleared with a CRM containing Clearing Cause: CON.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

As a Decadic route does not provide the Priority Breakdown Supplementary Service, there is no special Decadic signalling involved.

However, PBXs may assign a Breakdown Protection Level (BPL) to a call involving a Decadic Gateway, in the manner described in DPNSS[188], SECTION 35, paragraphs 2.3.1 and 2.3.2, by treating the Decadic trunk as an end destination in a similar manner to the way in which an ordinary extension would be treated. Thus a call originating from a Decadic route may be assigned a BPL higher than 0 by including PB-P in the ISRM/SSRM, and a call terminating at a Decadic route may be assigned a BPL higher than 0 by returning an LLM containing PB-P. The string SFI may also be included in either case.

If a Priority Breakdown Request (an ISRM containing PB-R) is received with a Destination Address which indicates a Decadic route and a free circuit is not available, the Gateway PBX must decide if any current Decadic calls can be broken down to make way for the requesting call, and if there is more than one, which one to break down.

If no existing Decadic call can be broken down to make way for the requesting call, that call should be cleared with a CRM containing Clearing Cause: CON.

If an existing Decadic call can be broken down, then a clear signal should be sent on the selected Decadic circuit and appropriate clearing action performed on behalf of the other party or parties which were involved in the call. If this results in the clearing of any DPNSS 1 channel, then the Clearing Cause: PFR should be used.

On completion of Decadic signalling to idle the circuit, or in the event on another one becoming free in the meantime, the call may proceed by seizing the free circuit on behalf of the requesting call upon which it becomes a simple DPNSS 1 to Decadic call. A NIM indicating Decadic encountered should be returned and signalling continued as described in SECTION 6 of this specification.

If the Decadic circuit fails to complete the clear within an appropriate time period, or call collision should occur on the outgoing Decadic circuit, the Gateway PBX may attempt to retry by breaking down another Decadic call. A PBX should limit the number of such retries attempted, and if this limit is reached, then the requesting call should be cleared with a CRM containing Clearing Cause: CON.

2.5 INTERWORKING WITH SSMF5

As the SSMF5 does not provide the Priority Breakdown Supplementary Service, there is no special SSMF5 signalling involved.

However, PBXs may assign a Breakdown Protection Level (BPL) to a call involving an SSMF5 Gateway, in the manner described in DPNSS[188], SECTION 35, paragraphs 2.3.1 and 2.3.2, by treating the SSMF5 trunk as an end destination in a similar manner to the way in which an ordinary extension would be treated. Thus a call originating from SSMF5 may be assigned a BPL higher than 0 by including PB-P in the ISRM/SSRM, and a call terminating at SSMF5 may be assigned a BPL higher than 0 by returning an LLM containing PB-P. The string SFI may also be included in either case.

If a Priority Breakdown Request (an ISRM containing PB-R) is received with a Destination Address which indicates an SSMF5 route and a free circuit is not available, the Gateway PBX must decide if any current SSMF5 calls can be broken down to make way for the requesting call, and if there is more than one, which one to break down.

If no existing SSMF5 call can be broken down to make way for the requesting call, that call should be cleared with a CRM containing Clearing Cause: CON.

If an existing SSMF5 call can be broken down, then a clear signal should be sent on the selected SSMF5 channel and appropriate clearing action performed on behalf of the other party or parties which were involved in the call. If this results in the clearing of any DPNSS 1 channel, then the Clearing Cause: PFR should be used.

On completion of SSMF5 signalling to idle the circuit, or in the event on another one becoming free in the meantime, the call may proceed by seizing the free circuit on behalf of the requesting call upon which it becomes a simple DPNSS 1 to SSMF5 call. A NIM indicating SSMF5 encountered should be returned and signalling continued as described in SECTION 6 of this specification.

If the SSMF5 circuit fails to complete the clear within an appropriate time period, or call collision should occur on the outgoing SSMF5 circuit, the Gateway PBX may attempt to retry by breaking down another SSMF5 call. A PBX should limit the number of such retries attempted, and if this limit is reached, then the requesting call should be cleared with a CRM containing Clearing Cause: CON.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 36 - SUPPLEMENTARY SERVICE : CALL BACK MESSAGING

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2.4 DECADIC PRIVATE CIRCUIT .....Page 3

2.5 SSMF5 .....Page 3

HISTORY

Issue 1 - March 1988

Issue 2 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Call Back Messaging Supplementary Service.

1.2 Subsection 2 details the Call Back Messaging Supplementary Service when DPNSS 1 interworks with other signalling systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide the Call Back Messaging Supplementary Service, there is no PSTN signalling involved.

If a PBX acting as a Gateway to the PSTN receives an ISRM containing either CBM-R or CBM-C, it shall respond with a CRM containing Clearing Cause: SSI and optionally CLC-PSTN. A CIM shall be expected in response.

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide the Call Back Messaging Supplementary Service, there is no DASS 2 signalling involved.

If a PBX acting as a Gateway to DASS 2 receives an ISRM containing either CBM-R or CBM-C, it shall respond with a CRM containing Clearing Cause: SSI and optionally CLC-ISDN. A CIM shall be expected in response.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

As a Decadic route does not provide the Call Back Messaging Supplementary Service, there is no Decadic signalling involved.

If a PBX acting as a Gateway to a Decadic route receives an ISRM containing either CBM-R or CBM-C, it shall respond with a CRM containing Clearing Cause: SSI and optionally CLC-DEC. A CIM shall be expected in response.

2.5 INTERWORKING WITH SSMF5

As SSMF5 does not provide the Call Back Messaging Supplementary Service, there is no SSMF5 signalling involved.

If a PBX acting as a Gateway to an SSMF5 route receives an ISRM containing either CBM-R or CBM-C, it shall respond with a CRM containing Clearing Cause: SSI and optionally CLC-MF5. A CIM shall be expected in response.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 37 - SUPPLEMENTARY SERVICE : LOOP AVOIDANCE

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HISTORY

Issue 1 - March 1988

Issue 2 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Loop Avoidance Supplementary Service.

1.2 Subsection 2 details the Loop Avoidance Supplementary Service when DPNSS 1 interworks with other signalling systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide the Loop Avoidance Supplementary Service, there is no special PSTN signalling involved.

However, a PSTN Gateway PBX may participate in the service as follows:

2.1.1 If an ISRM containing a Loop Avoidance (LA) string with a non-zero Parameter is received at a Gateway PBX on a DPNSS 1 to PSTN call then the LA string is discarded and the PSTN call proceeds as for a Simple Telephony Call.

2.1.2 If an ISRM containing a Loop Avoidance (LA) string with a zero Parameter is received at a Gateway PBX on a DPNSS 1 to PSTN call then the call is either cleared with Clearing Cause: NT or is allowed to proceed as for a Simple Telephony Call.

2.1.3 When a call is made from PSTN to DPNSS 1 the Gateway PBX may insert a Loop Avoidance (LA) string in the ISRM.

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide the Loop Avoidance Supplementary Service, there is no special DASS 2 signalling involved.

However, a DASS 2 Gateway PBX may participate in the service as follows:

2.2.1 If an ISRM containing a Loop Avoidance (LA) string with a non-zero Parameter is received at a Gateway PBX on a DPNSS 1 to DASS 2 call then the LA string is discarded and the DASS 2 call proceeds as for a Simple Telephony Call.

2.2.2 If an ISRM containing a Loop Avoidance (LA) string with a zero Parameter is received at a Gateway PBX on a DPNSS 1 to DASS 2 call then the call is either cleared with Clearing Clause: NT or is allowed to proceed as for a Simple Telephony Call.

2.2.3 When a call is made from DASS 2 to DPNSS 1 the Gateway PBX may insert a Loop Avoidance (LA) string in the ISRM.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

As a Decadic route does not provide the Loop Avoidance Supplementary Service, there is no special Decadic signalling involved.

However, a Decadic Gateway PBX may participate in the service as follows:

2.4.1 If an ISRM containing a Loop Avoidance (LA) string with a non-zero Parameter is received at a Gateway PBX on a DPNSS 1 to Decadic call then the LA string is discarded and the Decadic call proceeds as for a Simple Telephony Call.

2.4.2 If an ISRM containing a Loop Avoidance (LA) string with a zero Parameter is received at a Gateway PBX on a DPNSS 1 to Decadic call then the call is either cleared with Clearing Cause: NT or is allowed to proceed as for a Simple Telephony Call.

2.4.3 When a call is made from Decadic to DPNSS 1 the Gateway PBX may insert a Loop Avoidance (LA) string in the ISRM.

2.5 INTERWORKING WITH SSMF5

As SSMF5 does not provide the Loop Avoidance Supplementary Service, there is no special SSMF5 signalling involved.

However, an SSMF5 Gateway PBX may participate in the service as follows:

2.5.1 If an ISRM containing a Loop Avoidance (LA) string with a non-zero Parameter is received at a Gateway PBX on a DPNSS 1 to SSMF5 call then the LA string is discarded and the SSMF5 call proceeds as for a Simple Telephony Call.

2.5.2 If an ISRM containing a Loop Avoidance (LA) string with a zero Parameter is received at a Gateway PBX on a DPNSS 1 to SSMF5 call then the call is either cleared with Clearing Cause: NT or is allowed to proceed as for a Simple Telephony Call.

2.5.3 When a call is made from SSMF5 to DPNSS 1 the Gateway PBX may insert a Loop Avoidance (LA) string in the ISRM.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 38 - SUPPLEMENTARY SERVICE : FORCED RELEASE

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2.5 SSMF5 .....Page 4

HISTORY

Issue 1 - March 1988

Issue 2 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Forced Release Supplementary Service.

1.2 Subsection 2 details the Forced Release Supplementary Service when DPNSS 1 interworks with other signalling systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide the Forced Release Supplementary Service, there is no special PSTN signalling involved.

2.1.1 If a Forced Release Request (an EEM containing String FR-R) is received by an extension which was engaged on a call to the PSTN before the intrusion, the PBX must determine whether the release is allowed. The request shall then proceed as in DPNSS[188] SECTION 38, Paragraphs 2.3.1.2 and 2.3.1.3, with sending the CRM to the unwanted party's PBX being replaced by clearing the call to the PSTN.

2.1.2 As Intrusion is not possible, via the PSTN, a DPNSS 1 extension involved in a call to a PSTN customer shall have a Forced Release Request rejected by the Originating PBX.

2.1.3 If a Gateway PBX to the PSTN receives a Forced Release Request (an EEM containing FR-R) the request shall be rejected and an EEM containing String Reject (REJ) shall be returned.

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide the Forced Release Supplementary Service, there is no special DASS 2 signalling involved.

2.2.1 If a Forced Release Request (an EEM containing String FR-R) is received by an extension which was engaged on a call to DASS 2 before the intrusion, the PBX must determine whether the release is allowed. The request shall then proceed as in DPNSS[188] SECTION 38, Paragraphs 2.3.1.2 and 2.3.1.3, with sending the CRM to the unwanted party's PBX being replaced by clearing the call to DASS 2.

2.2.2 As Intrusion is not possible, via DASS 2, a DPNSS 1 extension involved in a call to a DASS 2 customer shall have a Forced Release Request rejected by the Originating PBX.

2.2.3 If a Gateway PBX to DASS 2 receives a Forced Release Request (an EEM containing FR-R) the request shall be rejected and an EEM containing String Reject (REJ) shall be returned.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

As a Decadic route does not provide the Forced Release Supplementary Service, there is no special Decadic signalling involved.

2.4.1 If a Forced Release Request (an EEM containing String FR-R) is received by an extension which was engaged on a call to a Decadic route before the intrusion, the PBX must determine whether the release is allowed. The request shall then proceed as in DPNSS[188] SECTION 38, Paragraphs 2.3.1.2 and 2.3.1.3, with sending the CRM to the unwanted party's PBX being replaced by clearing the call to the Decadic route.

2.4.2 As Intrusion is not possible via a Decadic route a DPNSS 1 extension involved in a call to a Decadic extension shall have a Forced Release Request rejected by the Originating PBX.

2.4.3 If a Gateway PBX to a Decadic route receives a Forced Release Request (an EEM containing FR-R) the request shall be rejected and an EEM containing String Reject (REJ) shall be returned.

2.5 INTERWORKING WITH SSMF5

As SSMF5 does not provide the Forced Release Supplementary Service, there is no special SSMF5 signalling involved.

2.5.1 If a Forced Release Request (an EEM containing String FR-R) is received by an extension which was engaged on a call to an SSMF5 route before the intrusion, the PBX must determine whether the release is allowed. The request shall then proceed as in DPNSS[188] SECTION 38, Paragraphs 2.3.1.2 and 2.3.1.3, with sending the CRM to the unwanted party's PBX being replaced by clearing the call to the SSMF5 route.

2.5.2 As Intrusion is not possible, via an SSMF5 route, a DPNSS 1 extension involved in a call to a SSMF5 extension shall have a Forced Release Request rejected by the Originating PBX.

2.5.3 If a Gateway PBX to a SSMF5 route receives a Forced Release Request (an EEM containing FR-R) the request shall be rejected and an EEM containing String Reject (REJ) shall be returned.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 39 - SUPPLEMENTARY SERVICE : TEXT MESSAGE

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2.4 DECADIC PRIVATE CIRCUIT .....Page 4

2.5 SSMF5 .....Page 4

HISTORY

Issue 1 - March 1988

Issue 2 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Text Message Supplementary Service.

1.2 Subsection 2 details the Text Message Supplementary Service when DPNSS 1 interworks with other signalling systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

As the PSTN does not provide the Text Message Supplementary Service, there is no PSTN signalling involved.

If a PBX acting as a Gateway to the PSTN receives an ISRM containing TEXT-M, it shall respond with a CRM containing Clearing Cause: SSI and optionally CLC-PSTN. A CIM shall be expected in response.

2.2 INTERWORKING WITH DASS 2

As DASS 2 does not provide the Text Message Supplementary Service, there is no DASS 2 signalling involved.

If a PBX acting as a Gateway to DASS 2 receives an ISRM containing TEXT-M, it shall respond with a CRM containing Clearing Cause: SSI and optionally CLC-ISDN. A CIM shall be expected in response.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

As a Decadic route does not provide the Text Message Supplementary Service, there is no Decadic signalling involved.

If a PBX acting as a Gateway to a Decadic route receives an ISRM containing TEXT-M, it shall respond with a CRM containing Clearing Cause: SSI and optionally CLC-DEC. A CIM shall be expected in response.

2.5 INTERWORKING WITH SSMF5

As SSMF5 does not provide the Text Message Supplementary Service, there is no SSMF5 signalling involved.

If a PBX acting as a Gateway to an SSMF5 route receives an ISRM containing TEXT-M, it shall respond with a CRM containing Clearing Cause: SSI and optionally CLC-MF5. A CIM shall be expected in response.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 40 - SUPPLEMENTARY SERVICE : CHARGE REPORTING

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HISTORY

Issue 1 - March 1988

Issue 2 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7
BTNR 190 Issue 2

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Charge Reporting Supplementary Service.

1.2 Subsection 2 details the Charge Reporting Supplementary Service when DPNSS 1 interworks with other signalling systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

2.1.1 Charge Reporting On An Incoming PSTN Circuit

Since the PSTN cannot supply Account Code details nor accept charging data, there is no PSTN signalling involved. However an incoming PSTN call may participate in the Charge Reporting Supplementary Service by the Gateway PBX handling the incoming PSTN circuit in the same way as it would handle an extension (see DPNSS[188] SECTION 40). Thus the Gateway PBX may assign an Account Code on behalf of the circuit in the event of receiving an Account Code Request (CH-ACR) String. In addition any cost data received from the Terminating PBX may be logged at the Gateway PBX which, if the Charge Reporting-Active (CH-ACT) String is received, is also free to request cost details from the Terminating PBX during the call or if the PSTN circuit clears first.

2.1.2 Charge Reporting On An Outgoing PSTN Circuit

2.1.2.1 In order to allow the Originating PBX to perform cost calculation on the basis of the number sent to the PSTN and its own timing process, the Originating PBX may request the digits sent to the PSTN by sending the Output Digits-Request (OPD-R) String in an EEM any time after receipt of the NAM. On receipt of OPD-R, the Gateway PBX returns the output digits in an EEM as a Parameter to the Output Digits (OPD) String.

Where known, the timed cost rate may be indicated on answer by the Gateway PBX including the Charge Reporting-Time Rate (CH-TR) String in the CCM. Changes in the timed rate which occur during the call may be indicated by including the String CH-TR in an EEM.

2.1.2.2 Since in general PSTN calls are charged, the String CH-ACT should always be included in the CCM sent to indicate that answer has (or is deemed to have) taken place on the PSTN circuit. In addition, if the Gateway PBX requires an Account Code for its own purpose, it should also include the String CH-ACR in the CCM. The signalling procedures for Account Code identification as described in DPNSS[188] SECTION 40 then apply.

2.1.2.3 The Gateway PBX may derive call cost incurred on an outgoing PSTN circuit either on the basis of received Subscriber Private Metering (SPM) pulses or on timing of the call and analysis of the output digits. Given this information, the signalling described in DPNSS[188] SECTION 40 is used to relay the cost details and obtain Account Code data from the originating party as follows:

Where a Gateway PBX is receiving SPM pulses, the number of pulses received so far is indicated via the Charge Reporting-Units Used (CH-UU) String. If known, the cost of a SPM unit may also be represented by the Charge Reporting-Unit Rate (CH-UR) String. In addition the Charge Reporting Cost (CH-CST) String may be sent if the Gateway PBX can determine the monetary cost of the call. If CH-UR is not received by the Originating PBX it may assume a value based on the knowledge that the PSTN has been encountered.

If meter pulses are not received or recognised from the PSTN, charge data may still be available if the Gateway PBX can determine cost by timing. Since charge data must always be represented in terms of units and optionally in terms of monetary cost, information derived by timing must be represented with a suitable combination of CH-UU and CH-UR by assigning a number of monetary units as a charge unit. Since this assignment will probably differ from PBX to PBX, CH-UR must always be sent. The cost may still be represented in monetary format by also sending String CH-CST.

During the call, cumulative call cost details may be relayed in an EEM to the Originating PBX on receipt of further meter pulses from the PSTN, on a timed basis, or on request from the Originating PBX.

On call completion, the clear down procedures detailed in DPNSS[188] SECTION 40 are used to ensure that the up to date cost is obtained by the Originating PBX irrespective of which party clears first.

2.2 INTERWORKING WITH DASS 2

Call Charge Indication (CCI) is specified in BTNR 190 (DASS 2) as an optional Supplementary Service on calls to DASS 2. It is optional in the sense that the service need not be supported by a PBX, and that even if the service is supported, CCI may not be provided on all calls.

Whether or not the DASS 2 CCI Supplementary Service is supported affects the way in which the DPNSS 1 Charge Reporting Supplementary Service interworks with DASS 2.

2.2.1 Outline of Operation

Interworking of the Charge Reporting Supplementary Service between DPNSS 1 and DASS 2 is provided by the following signalling sequences:

i. Charge Reporting on an incoming DASS 2 channel.

ii. Charge Reporting on an outgoing DASS 2 channel.

iii. Interworking with the DASS 2 CCI Supplementary Service.

2.2.2 Charge Reporting On An Incoming DASS 2 Channel

Since DASS 2 cannot supply Account Code details nor accept charging data, there is no DASS 2 signalling involved. However an incoming DASS 2 call may participate in the Charge Reporting Supplementary Service by the Gateway PBX handling the incoming DASS 2 channel in the same way as it would handle an extension (see DPNSS[188] SECTION 40). Thus the Gateway PBX may assign an Account Code on behalf of the channel in the event of receiving an Account Code Request (CH-ACR) String. In addition any cost data received from the Terminating PBX may be logged at the Gateway PBX which, if the String CH-ACT is received, is also free to request cost details from the Terminating PBX during the call or if the DASS 2 channel clears first.

2.2.3 Charge Reporting On An Outgoing DASS 2 Channel

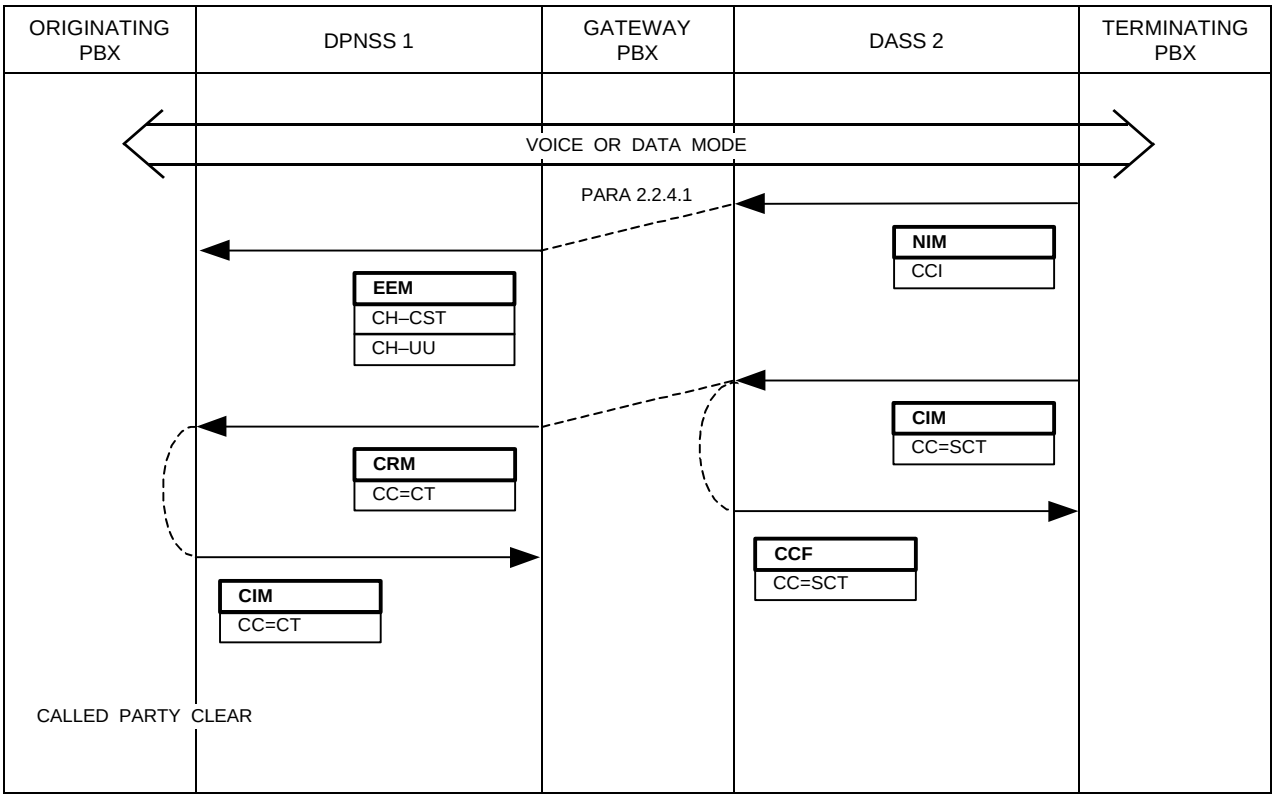
2.2.3.1 In order to allow the Originating PBX to perform cost calculation on the basis of the number sent to DASS 2 and its own timing process, the Originating PBX may request the digits sent to DASS 2 by sending the String Output Digits-Request (OPD-R) in an EEM any time after receipt of the NAM. On receipt of OPD-R, the Gateway PBX returns the output digits in an EEM as a parameter to the String Output Digits (OPD).

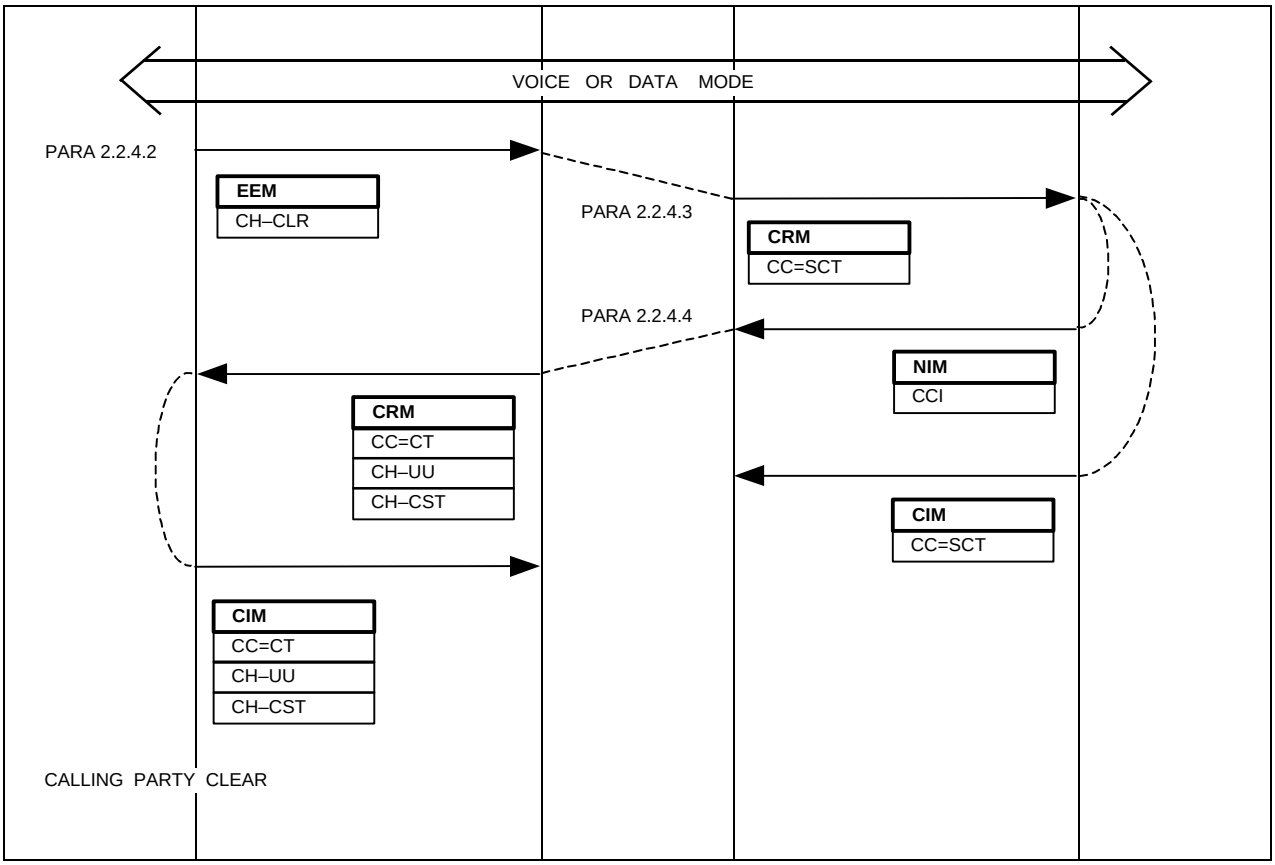
Where known, the timed cost rate may be indicated on answer by the Gateway PBX including the String CH-TR in the CCM. Changes in the timed rate which occur during the call may be indicated by including the String CH-TR in an EEM.

2.2.3.2 Since in general DASS 2 calls are charged, the String CH-ACT should always be included in the DPNSS 1 CCM sent when the DASS 2 CCM is received. In addition, if the Gateway PBX requires an Account Code for its own purpose, it should also include the String CH-ACR in the DPNSS 1 CCM. The signalling procedures for Account Code identification as described in DPNSS[188] SECTION 40 then apply.

2.2.3.3 If the DASS 2 CCI service is not subscribed to, call cost evaluated by timing may be relayed to the Originating PBX either during the call or on termination of the call as in the case of calls to the PSTN. If the DASS 2 CCI service is subscribed to, call cost is only available on call cleardown as described in 2.2.4.

2.2.4 INTERWORKING WITH THE DASS 2 CCI SERVICE.





2.2.4.1 If the DASS 2 CCI Supplementary Service is subscribed to and the DASS 2 circuit clears first, the details of cost as received in the DASS 2 NIM are relayed in an EEM to the Originating PBX by using the first parameter of the DASS 2 CCI String as the parameter to the CH-UU String, and the second parameter of the DASS 2 CCI String to generate the parameters to the CH-CST String. The DPNSS 1 call path is cleared as for normal cleardown from DASS 2 to DPNSS 1.

As an example of String mapping, if the following is received from DASS 2:

*CA*25*£2.53*0#

then the following shall be sent to DPNSS 1:

*187*253*0 1*A#*190*25#

NOTE: The final parameter to the first Supplementary information String indicating that the cost is in pence is optional and need not be sent.

2.2.4.2 If the DASS 2 CCI service is subscribed to and the originating party clears first and the Originating PBX wishes to obtain cost details, an EEM containing Charge Reporting-Clear (CH-CLR) is sent.

2.2.4.3 On receipt of CH-CLR, a DASS 2 CRM with Clearing Cause: SCT is sent.

2.2.4.4 On receipt of DASS 2 NIM indicating cost details, a DPNSS 1 CRM is sent including Strings CH-UU and CH-CST coded as above. A DASS 2 CIM is awaited on the DASS 2 channel and a DPNSS 1 CIM is awaited on the DPNSS 1 channel.

If no DASS 2 NIM is received, a DPNSS 1 EEM containing String SU with Parameter CH-CLR is sent. The DPNSS 1 channel may also be cleared from the Gateway PBX by sending a DPNSS 1 CRM with Clearing Cause: CT.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

2.4.1 Charge Reporting On An Incoming Decadic Circuit

Since Decadic cannot supply Account Code details nor accept charging data, there is no Decadic signalling involved. However an incoming Decadic call may participate in the

Charge Reporting service by the Gateway PBX handling the incoming Decadic circuit in the same way as it would handle an extension (see DPNSS[188] SECTION 40). Thus the Gateway PBX may assign an Account Code on behalf of the circuit in the event of receiving an Account Code Request (CH-ACR) String. In addition any cost data received from the Terminating PBX may be logged at the Gateway PBX which, if the Charge Reporting-Active (CH-ACT) String is received, is also free to request cost details from the Terminating PBX during the call or if the Decadic circuit clears first.

2.4.2 Charge Reporting On An Outgoing Decadic Circuit

Since Decadic cannot supply charging data, there is no Decadic signalling involved. If the Originating PBX requests charging information by sending an EEM containing Charge Reporting-Cost Request (CH-CR) or Charge Reporting-Clear (CH-CLR), the Gateway PBX responds with an EEM containing SU.

2.5 INTERWORKING WITH SSMF5

2.5.1 Charge Reporting On An Incoming SSMF5 Circuit

Since SSMF5 cannot supply Account Code details nor accept charging data, there is no SSMF5 signalling involved. However an incoming SSMF5 call may participate in the Charge Reporting Supplementary Service by the Gateway PBX handling the incoming SSMF5 circuit in the same way as it would handle an extension (see DPNSS[188] SECTION 40). Thus the Gateway PBX may assign an Account Code on behalf of the circuit in the event of receiving an Account Code Request (CH-ACR) String. In addition any cost data received from the Terminating PBX may be logged at the Gateway PBX which, if String CH-ACT is received, is also free to request cost details from the Terminating PBX during the call or if the SSMF5 circuit clears first.

2.5.2 Charge Reporting On An Outgoing SSMF5 Circuit

Since SSMF5 cannot supply charging data, there is no SSMF5 signalling involved. If the Originating PBX requests charging information by sending an EEM containing CH-CR or CH-CLR, the Gateway PBX responds with an EEM containing SU.

INTERWORKING BETWEEN DPNSS 1 AND OTHER SIGNALLING SYSTEMS

SECTION 41 - SUPPLEMENTARY SERVICE : NETWORK ADDRESS EXTENSION

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HISTORY

Issue 1 - March 1988

Issue 2 - December 2001 - Specification renamed as DPNSS[189]

REFERENCES

DPNSS[188] Global Issue 7

1 GENERAL

1.1 This Section details the signalling requirements for PBXs which support interworking between DPNSS 1 and other signalling systems for the Network Address Extension Supplementary Service.

1.2 Subsection 2 details the Network Address Extension Supplementary Service when DPNSS 1 interworks with other signalling systems. The description is given in the form of explanatory text.

1.3 Coding of the contents of messages is given in SECTION 4 of DPNSS[188].

2 INTERWORKING WITH OTHER SIGNALLING SYSTEMS

2.1 INTERWORKING WITH THE PSTN

Since the PSTN does not provide the Network Address Extension Supplementary Service, there is no special PSTN signalling involved.

However, if on a call to the PSTN, a Gateway PBX receives NAE data in a DPNSS 1 ISRM, it may either ignore it, allowing the call to continue and returning the String IG-SU in a DPNSS 1 NIM, or it may reject the call by returning a DPNSS 1 CRM containing Clearing Cause: NAE-E and optionally CLC-PSTN.

2.2 INTERWORKING WITH DASS 2

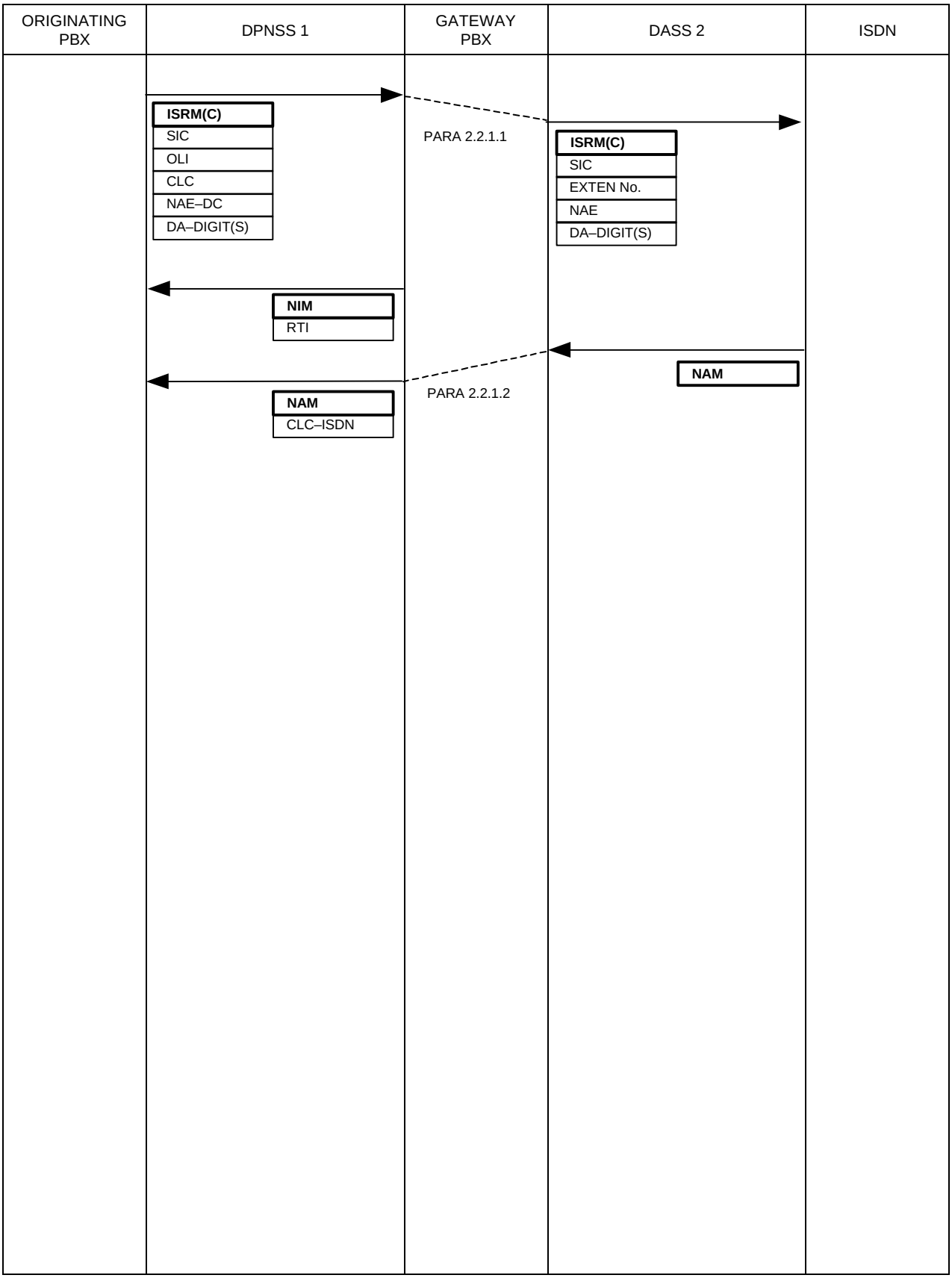
Network Address Extension is specified in BTNR 190 (DASS 2) as an optional Supplementary Service on calls to and from DASS 2. It is optional in the sense that the service need not be supported by a PBX, and that even if the service is supported, it may only be available on certain calls.

Interworking between the NAE Supplementary Services of DASS 2 and DPNSS 1 is shown in the following signalling sequences:

2.2.1 Network Address Extension On a call from DPNSS 1 to DASS 2.

2.2.2 Network Address Extension On a call from DASS 2 to DPNSS 1.

2.2.1 NETWORK ADDRESS EXTENSION ON A CALL FROM DPNSS 1 TO DASS 2

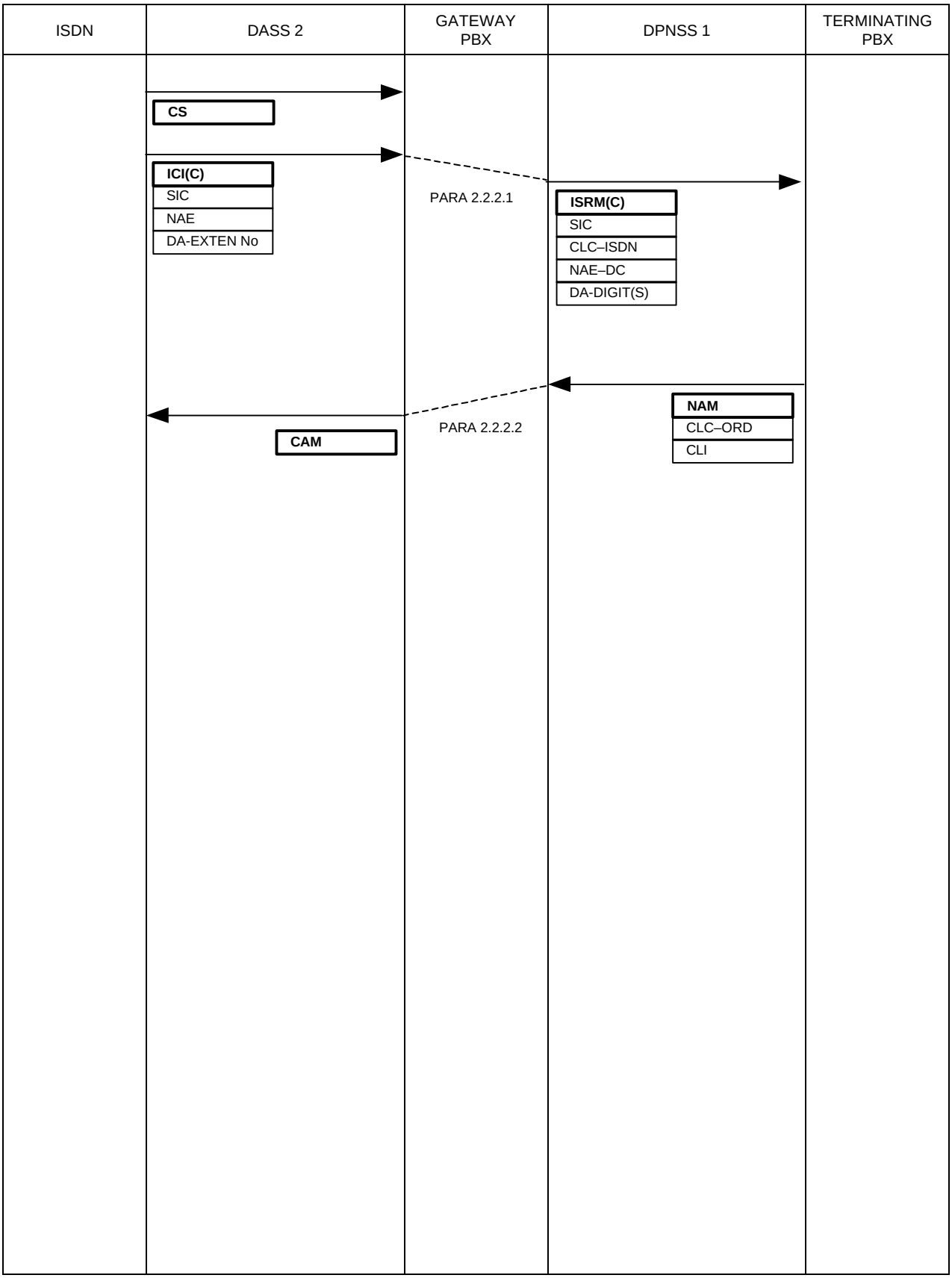


2.2.1.1 When a DPNSS 1 ISRM with NAE data is received with a Destination Address which identifies a DASS 2 destination and which can be passed on to DASS 2, a DASS 2 ISRM is sent as for a Simple Call with the DASS 2 String NAE added.

If the DPNSS 1 NAE data cannot be passed to DASS 2 (eg the DASS 2 call is not Category 1, or the NAE Supplementary Service is not subscribed to, or the data is not in a suitable format for inclusion in a DASS 2 NAE String) the call may either proceed as a Simple Call to DASS 2 with a NIM containing IG-SU returned, or the call may be rejected by returning a DPNSS 1 CRM containing Clearing Cause: NAE-E.

2.2.1.2 On receipt of a DASS 2 NAM, the call proceeds as a Simple Call from DPNSS 1 to DASS 2. If, however, the DASS 2 NAM contains an indication that NAE has been ignored, a DPNSS 1 NIM containing IG-SU shall be sent before the DPNSS 1 NAM.

2.2.2 NETWORK ADDRESS EXTENSION ON A CALL FROM DASS 2 TO DPNSS 1.



2.2.2.1 If a call from DASS 2 is received with NAE data with a Destination Address identifying a DPNSS 1 extension, a DPNSS 1 ISRM is sent as for a Simple Call with the String NAE-DC included.

2.2.2.2 On receipt of a DPNSS 1 NAM, a DASS 2 CAM is returned and the call proceeds as a Simple Call.

There is no mechanism in DASS 2 to indicate that NAE data received has been ignored. Thus if a DPNSS 1 NIM containing IG-SU or IG-SNU is received it must be discarded by the Gateway PBX.

2.3 INTERWORKING VIA DASS 2

NOT ISSUED

2.4 INTERWORKING WITH A DECADIC PRIVATE CIRCUIT

Since a Decadic route does not provide the Network Address Extension Supplementary Service, there is no special Decadic signalling involved.

However, if on a call to Decadic, a Gateway PBX receives NAE data in a DPNSS 1 ISRM, it may either ignore it, allowing the call to continue and returning the String IG-SU in a DPNSS 1 NIM, or it may reject the call by returning a DPNSS 1 CRM containing Clearing Cause: NAE-E and optionally CLC-DEC.

2.5 INTERWORKING WITH SSMF5

Since SSMF5 does not provide the Network Address Extension Supplementary Service, there is no special SSMF5 signalling involved.

However, if on a call to SSMF5, a Gateway PBX receives NAE data in a DPNSS 1 ISRM, it may either ignore it, allowing the call to continue and returning the String IG-SU in a DPNSS 1 NIM, or it may reject the call by returning a DPNSS 1 CRM containing Clearing Cause: NAE-E and optionally CLC-MF5.