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Fascicle 2/3

(09/97)

SERIES Q: SWITCHING AND SIGNALLING

Intelligent Network

Distributed functional plane for intelligent network Capability Set 2: Part 2

ITU-T Recommendation Q.1224 – Fascicle 2/3

(Previously CCITT Recommendation)

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Recommendation Q.1224

DISTRIBUTED FUNCTIONAL PLANE FOR INTELLIGENT NETWORK CAPABILITY SET 2

FASCICLE 2

FOREWORD

ITU (International Telecommunication Union) is the United Nations Specialized Agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the ITU. The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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Recommendation Q.1224

DISTRIBUTED FUNCTIONAL PLANE FOR INTELLIGENT NETWORK CAPABILITY SET 2

(Geneva, 1997)

PART 2

10 Mapping of the global functional plane to the distributed functional plane

The general aspects of GFP to DFP mapping are described in clause 5/Q.1204.

Mapping of the BCP and BCUP SIBs in the GFP to the DFP is addressed in 11.3.

This clause relates the Points of Initiation (POIs) and Points of Synchronization (POSs) from the GFP to the Trigger Detection Point-Requests (TDP-Rs) and Points in Call (PICs) of the DFP. Mapping from the GFP to TDP-Ns and EDPs is not addressed and is beyond the scope of IN CS-2.

10.1 Mapping of POIs and POSs to DPs and PICs

Figure 10-1 shows a stage 2 SDL representation of a triggering mechanism incorporating stage 1 POIs and POSs. It represents actions of a DP-R and its interaction with SIB-based service logic, as represented in the DFP. TDP-R functionality consists of an initiating message from the SSF to the SCF, whereupon the SSF awaits SCF input. The SCF portion of the TDP-R is an incomplete process, into which SDL process segments representing SIBs are connected to define the service. The type of return message from the SCF determines subsequent activities in the SSF. Note that only the high-priority POSs are shown in the figure.

A one-to-one mapping between the POI/POSs in the GFP and the DPs and PICs in the DFP is not always possible due to the granularity of the GFP. For instance, the “Proceed with new data” POS can be precisely defined in the GFP, but in the DFP it may map to the same DP-R that launched the request for service logic processing. The following list provides insight into the mapping, but precise mapping may only be determined by the actual SIB service logic representation for each IN supported service.

The following table describes the mapping of the BCP POIs to the BCSM DPs.

BCP SIB

POI	**DP-R**
Call Originated	Origination Attempt
Call Authorized	Origination Attempt Authorized Termination Attempt Authorized
Address Collected	Collected Information
Address Analyzed	Analysed Information
Prepare to complete call	Termination Attempt
Facility Available	Facility Selected and Available

Busy	O_Called_Party_Busy T_Busy
Routing Failure	Route_Select_Failure
No Answer	O_No_Answer T_No_Answer
Call Acceptance	O_Answer T_Answer
Call Interrupted	O_Midcall T_Midcall
Call Suspended	O_Suspend T_Suspend
Call Re-answered	O Re-answer T Re-answer
End of Call	O_Disconnect T_Disconnect
Call Abandoned	O_Abandon T_Abandon

The following table describes the mapping of the BCP POSs to the BCSM DPs and/or PICs.

BCP SIB

POS	**DP/PIC**
Continue with data	Several DPs (Return to the same DP from which service logic was launched)
Proceed with new data	Several PICs (Return to the PIC specified by service logic)
Handle as transit	Analyse_Information or Select_Route PICs
Clear Call	O_Null T_Null
Enable_call party handling	Several DPs (Return to the same DP from which service logic was launched)
Initiate Call	Analyse_Information or Select_Route PICs in a new BCSM

The following table describes the mapping of the BCUP POSs to the BCUSM DPs and/or PIAs.

BCUP SIB

POS	**DP/PIA**
Continue with data	Several DPs (Return to the same DP from which service logic was launched)
Proceed with new data	Several PICs (Return to the PIA specified by service logic)
Release Association	Release

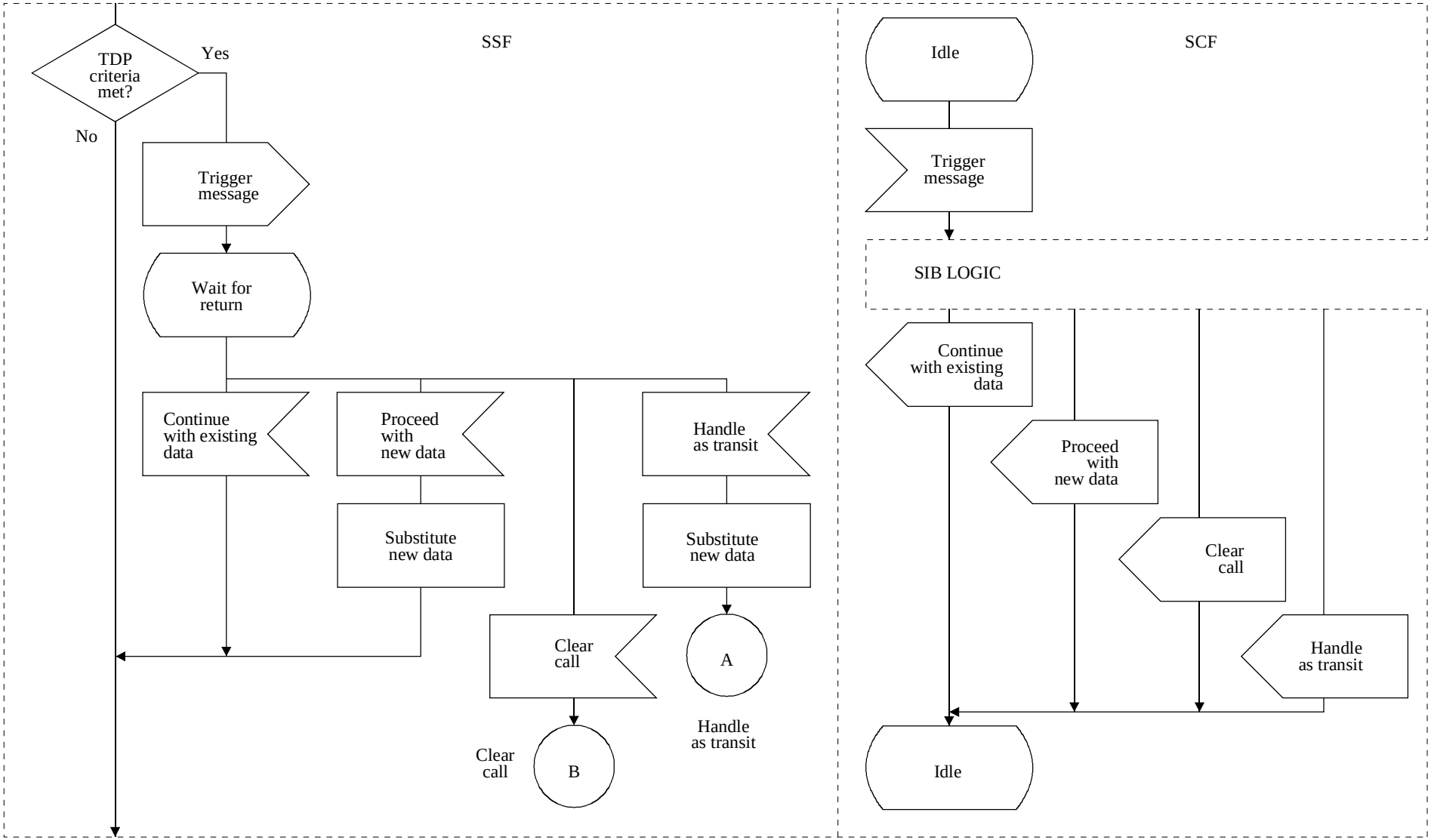


Figure 10-1/Q.1224 – Stage 2 SDL representation of a triggering mechanism incorporating POIs and POSs

A possible definition of a terminating screening service is shown in Figure 10-2. From the call arrival POI, the SCREEN SIB is used to determine if the calling user is on the list of users allowed to terminate a call at the destination. If on the list, the call is permitted, and the BCP continues call handling with the existing data. If the calling user is not on the list, the USER INTERACTION SIB is used to deliver an appropriate disconnection message to the caller, at which time the BCP clears the call.

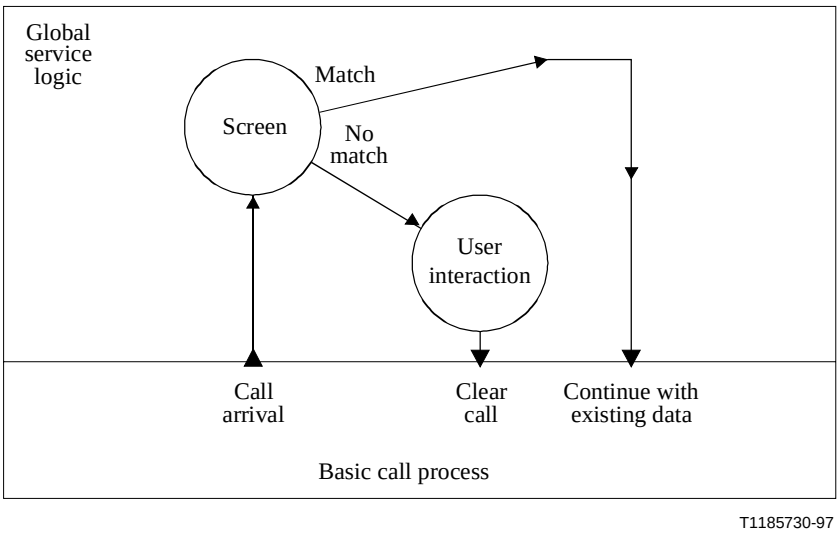


Figure 10-2/Q.1224 – GFP terminating screening service

Figure 10-3 contains the DFP view of this service in terms of the DFP representations of the SCREEN and USER INTERACTION SIBs and SDL representation of the triggering mechanism.

Note that simplified stage 1 SDLs are used to represent the SCREEN SIB and the USER INTERACTION SIB. They are used only for illustrative purposes in the figure.

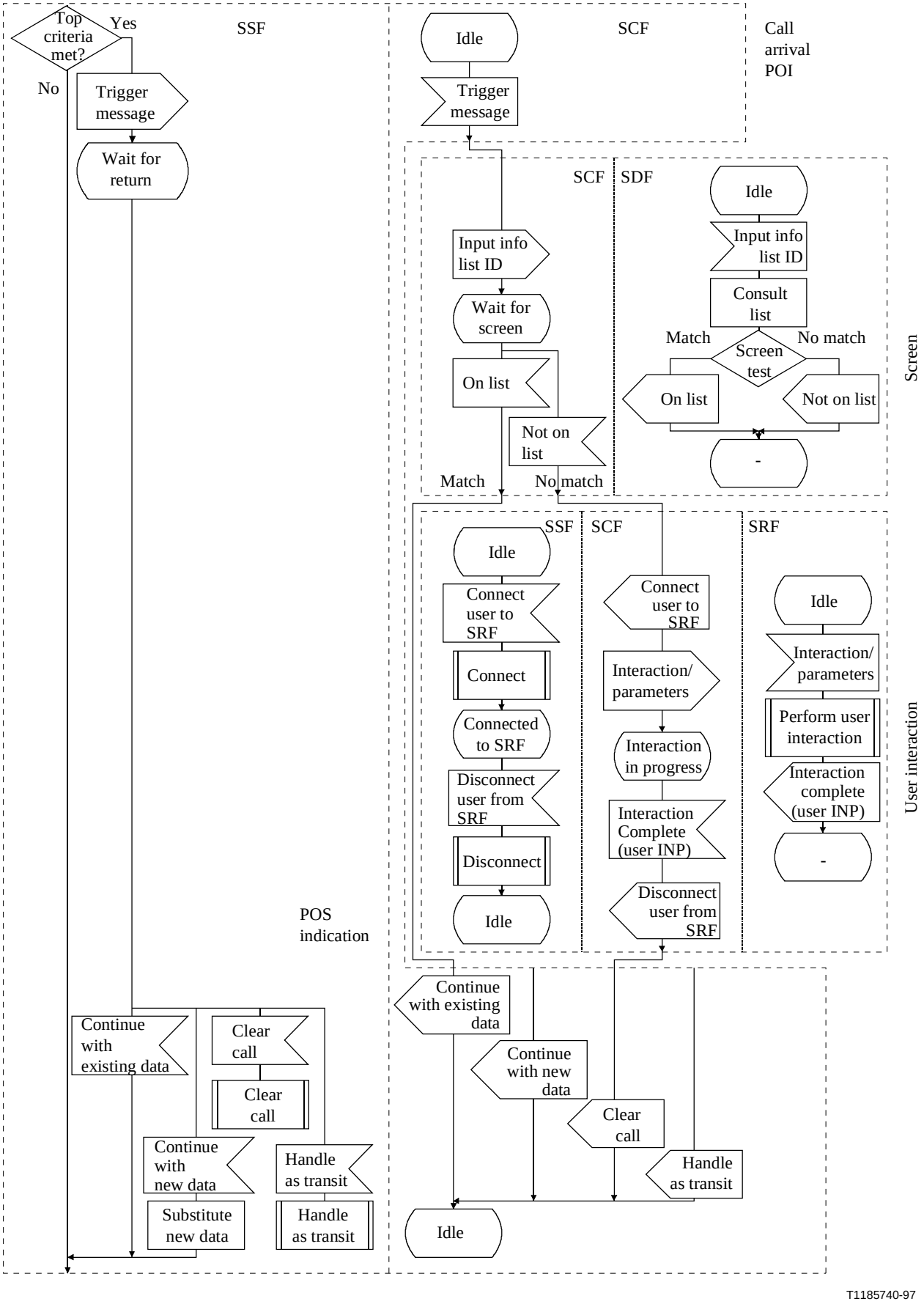


Figure 10-3/Q.1224 – DFP terminating screening showing DFP SIB representations

11 Information flow diagrams and distributed service logic in the DFP

11.1 Introduction

This clause provides stage 2 descriptions for Service Independent Building Blocks (SIBs) for the intelligent network that are used in executing supplemented services. The functional entities involved, information flows and functional entity actions required to provide the SIBs are defined. Each SIB, along with other SIBs, can be used and reused as an element of various supplemented services. While SIBs are defined in the global functional plane, their interface requirements may be seen in the distributed functional plane of the intelligent network conceptual model. A detailed mapping between SIB operations in the GFP and SIB behaviour in the DFP is outside the scope of IN CS-2. SIBs and SIB operations are described in Recommendation Q.1223.

The following SIB Stage 2 functions are unchanged from Recommendation Q.1214 (1995):

ALGORITHM, CHARGE, COMPARE, DISTRIBUTION, STATUS NOTIFICATION, VERIFY.

The following SIB Stage 2 functions are modified from those in Recommendation Q.1214 (1995):

AUTHENTICATE, LOG CALL INFORMATION, QUEUE, SCREEN, SERVICE DATA MANAGEMENT, TRANSLATE, USER INTERACTION.

The following SIB has been renamed but the SIB Stage 2 function is unchanged from Recommendation Q.1214 (1995):

LIMIT SIB renamed to SERVICE FILTER SIB.

The following SIB Stage 2 functions are not contained in Recommendation Q.1214 (1995):

BASIC CALL UNRELATED PROCESS, END, INITIATE SERVICE PROCESS, JOIN, MESSAGE HANDLER, SPLIT.

11.1.1 Functional model

Figure 11-1 depicts the functional entities and their relationships that are used in describing SIBs in the distributed functional plane of the intelligent network. It also shows the relationship of service control to basic call processing functional entities. Functional entities are assumed to have the basic capabilities to perform properly their assigned function in the IN.

11.1.2 Description of functional entities

Functional entities are described in clause 3.

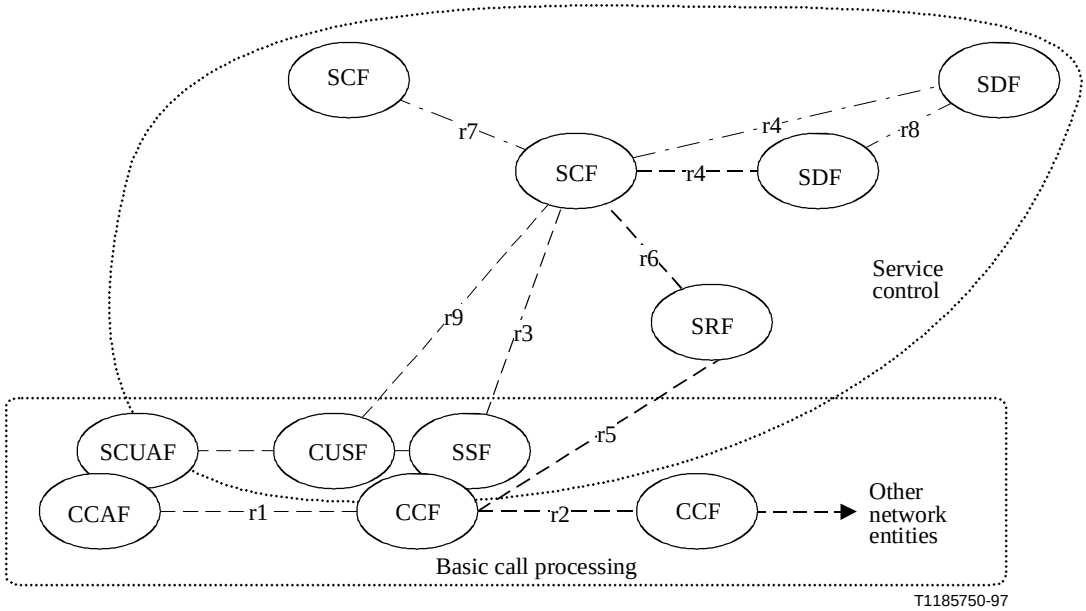


Figure 11-1/Q.1224 – Functional diagram showing service control for executing SIBs and its relationship to basic call processing

11.1.3 Numbering of functional entity actions

Functional entity actions are numbered XYYZ, where:

X represents the functional entity;

2 represents the CCF/SSF;

3 represents the SRF;

4 represents the SDF;

5 represents the CUSF;

9 represents the SCF.

YY represents the number of the SIB. Table 11-1 contains the mapping between the SIBs and the YY numbers, both alphabetically by SIB name and numerically in YY order.

Table 11-1/Q.1224 – Mapping between SIBs and YY values

SIB name	YY value	YY value	SIB name
ALGORITHM	01	00	BASIC CALL PROCESS
AUTHENTICATE	14	01	ALGORITHM
CHARGE	02	02	CHARGE
COMPARE	03	03	COMPARE
DISTRIBUTION	04	04	DISTRIBUTION
END	16	05	SERVICE FILTER
INITIATE SERVICE PROCESS	15	06	LOG CALL INFORMATION
JOIN	18	07	QUEUE
LOG CALL INFORMATION	06	08	SCREEN
MESSAGE HANDLER	17	09	SERVICE DATA MANAGEMENT
QUEUE	07	10	STATUS NOTIFICATION
SCREEN	08	11	TRANSLATE
SERVICE DATA MANAGEMENT	09	12	USER INTERACTION
SERVICE FILTER	05	13	VERIFY
SPLIT	19	14	AUTHENTICATE
STATUS NOTIFICATION	10	15	INITIATE SERVICE PROCESS
TRANSLATE	11	16	END
USER INTERACTION	12	17	MESSAGE HANDLER
VERIFY	13	18	JOIN
BASIC CALL PROCESS	00	19	SPLIT
BASIC CALL UNRELATED PROCESS	20	20	BASIC CALL UNRELATED PROCESS
Distributed functionality	41	41	Distributed functionality

Z distinguishes the particular functional entity actions which have a common XYY. Z may be two digits.

Only Functional Entity Actions (FEAs) pertinent to each SIB are shown in the information flow and SDL diagrams.

11.1.4 Relationship with clause 12 (information flow descriptions)

Detailed descriptions of the information flows and information elements are provided in clause 12.

Note that both in this subclause and in clause 12, information flows relating to error conditions are not described.

11.1.5 Organization of clause 11

Subclause 11.2 provides the stage 2 description of the SIBs of 5.1 to 5.19/Q.1223.

Subclause 11.3 provides the stage 2 description of the BASIC PROCESS SIBs described in clause 6/Q.1223.

Subclause 11.4 provides the stage 2 description of functionality required due to network distribution.

Subclause 11.5 provides the description of the complete distributed service logic for all FEs.

11.1.5.1 SDL diagrams in subclauses 11.2, 11.3 and 11.5

The SDL diagrams in the stage 2 descriptions in 11.2 and 11.3 are fragments of the complete distributed service logic of 11.5. The SDL diagrams of 11.2 and 11.3 show information flows and the processing actions described by the FEAs. The SDLs of 11.5 show the complete rules of sequencing of information flows, but does not include the FEAs, since their inclusion would add no information to that already contained in the SDLs of 11.2 and 11.3.

In subclauses 11.2 and 11.3 the names of states and input events are the same as in the distributed service logic, except that a composite state name may be used where more than one state is possible.

11.1.6 Generic security information flows

Any interface within the IN functional architecture may have the need to apply security functions to the information flows passing between functional entities. This subclause defines a generic set of information flows and distributed service logic to enable any interfaces to provide suitable secured communications.

For IN CS-2 the provision for security is required for the SCF-SDF, SCF-SCF, SDF-SDF interfaces. Other interfaces may have the security applied to them at the discretion of the network operator.

Two different levels of security procedures are possible on information flows between Functional Entities:

- Service User Authentication, which provides secure access by a user to the functions of a FE.
- Peer FE Authentication, which provides secured communications between two FEs. This is for further study.

11.1.6.1 Service user authentication information flows

Providing secured access to FE functions requires that a "User" be authenticated as being allowed to perform the function within the FE. In this case the "User" refers to the Service User and not the invoking FE. The information flows for a simple operation exchange between two FEs are shown in Figure 11-2.

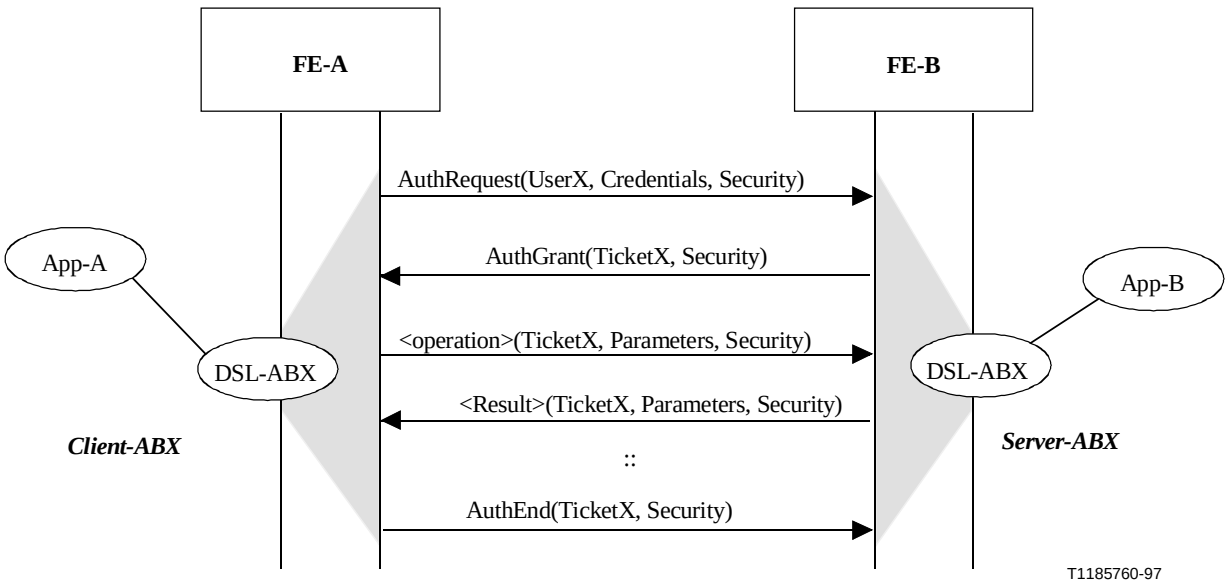


Figure 11-2/Q.1224 – User Authentication and simple operation sequence

The terms used in the figure are defined below:

App-A: Denotes the logic application executing within FE-A.

DSL-ABX: Denotes the Distributed Service Logic (DSL) Finite State Machine (FSM) responsible for controlling the interface between FE-A and FE-B for User X. A separate FSM pair will be required for each User X using the interface.

AuthRequest: This is the information flow[5] which is used to request the authentication of a service User. It provides the following elements:

- **UserX**: Identifies the user to be authenticated.
- **Credentials**: The information required to authenticate UserX.
- **Security**: Optional information to ensure data origin authentication and data integrity.

AuthGrant: This information flow provides the security ticket to be used for subsequent operations by User X on the interface. It contains the following elements:

- **TicketX**: A security ticket[6] identifying an authenticated user.
- **Security**: Optional information to ensure data origin authentication and data integrity.

AuthEnd: This information flow terminates the authorization of a service User. It contains the following elements:

- **TicketX**: A security ticket identifying an authenticated user.
- **Security**: Optional information to ensure data origin authentication and data integrity.

<operation>: This information flow refers to one of the operations which have been defined as occurring between the two FEs. It contains the following elements:

- **TicketX**: A security ticket identifying an authenticated user. It is used by the FE to determine if the user can access the function.
- **Parameters**: This can contain a number of elements which make up the information required to perform the operation.
- **Security**: Optional information to ensure data origin authentication and data integrity.

<result>: This information flow refers to one of the operation results which have been defined as occurring between the two FEs. It contains the following elements:

- **TicketX**: A security ticket identifying an authenticated user. It is used by the FE to determine if the user can access the function.
- **Parameters**: This can contain a number of elements which make up the information returned in the operation result.
- **Security**: Optional information to ensure data origin authentication and data integrity.

---

[5] Note: The use of AuthRequest, AuthGrant and AuthEnd as IF names are for illustration purposes only.

[6] This is similar to the Authorised Relationship Id currently defined in IN CS-1 SCF-SDF Information flows.

NOTE – Any number of <operation> <result> pairs can be exchanged between a AuthGrant and a AuthEnd information flow.

The existing AuthRequest and AuthGrant generic security information flows provide unilateral authentication (of service user to FE-B) or mutual authentication (using credentials or secure time-stamps) between the service user and FE-B.

For three-way mutual authentication, an additional (optional) set of Information Flows (IFs) are required (and depicted in Figure 11-3). These IFs are equivalent to the existing AuthRequest and AuthGrant information flows. The first set of AuthRequest1 and AuthGrant1 IFs may be used to unilaterally authenticate FE-B to the service user. The second set of IF exchanges from FE-B to FE-A (AuthRequest2 and AuthGrant2) will provide unilateral authentication of the service user to FE-B. Finally, the original set of AuthRequest and AuthGrant IFs are used to convey Directory related information in an Empty Bind. It should be noted that the information contained in the information elements of these IFs may be combined in the protocol realization (e.g. AuthGrant1 and AuthRequest2 information may be combined at the protocol level).

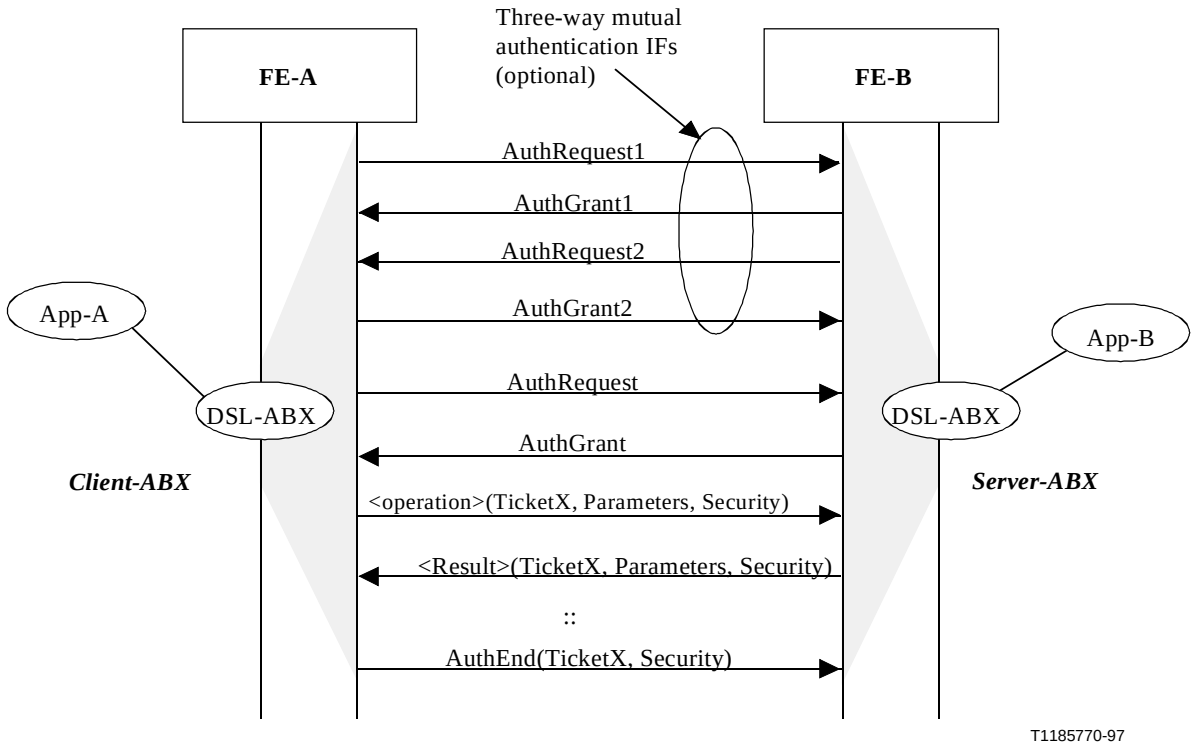


Figure 11-3/Q.1224 – Three-way Mutual User Authentication and simple operation sequence

A generic security state machine for three-way mutual authentication corresponding to these generic information flows is described in clause 19/Q.1228. Since this is an additional (and optional) capability, its impact on subsequent subclauses in this Recommendation is not explicitly described.

11.1.6.2 Peer FE Authentication Information Flows

There are no generic information flows defined for peer FE authentication. It is expected that each IF requiring this form of authentication will include security parameters to hold the authentication information. For IN CS-2 peer authentication will be handled by establishment of prior agreements to permit communication between the FEs. Other methods are for further study.

11.1.6.3 Applicable interfaces within the IN DFP Architecture

The User Authentication information flows can described above can be applied to a number of the FEs within the IN CS-2 Functional Architecture. It should also be noted that the operation being performed in the referral and chaining cases is the same operation on the different interfaces. The mapping of the generic information flows to specific information flows is shown in Table 11-2.

Table 11-2/Q.1224 – Mapping of generic information flows to specific information flows

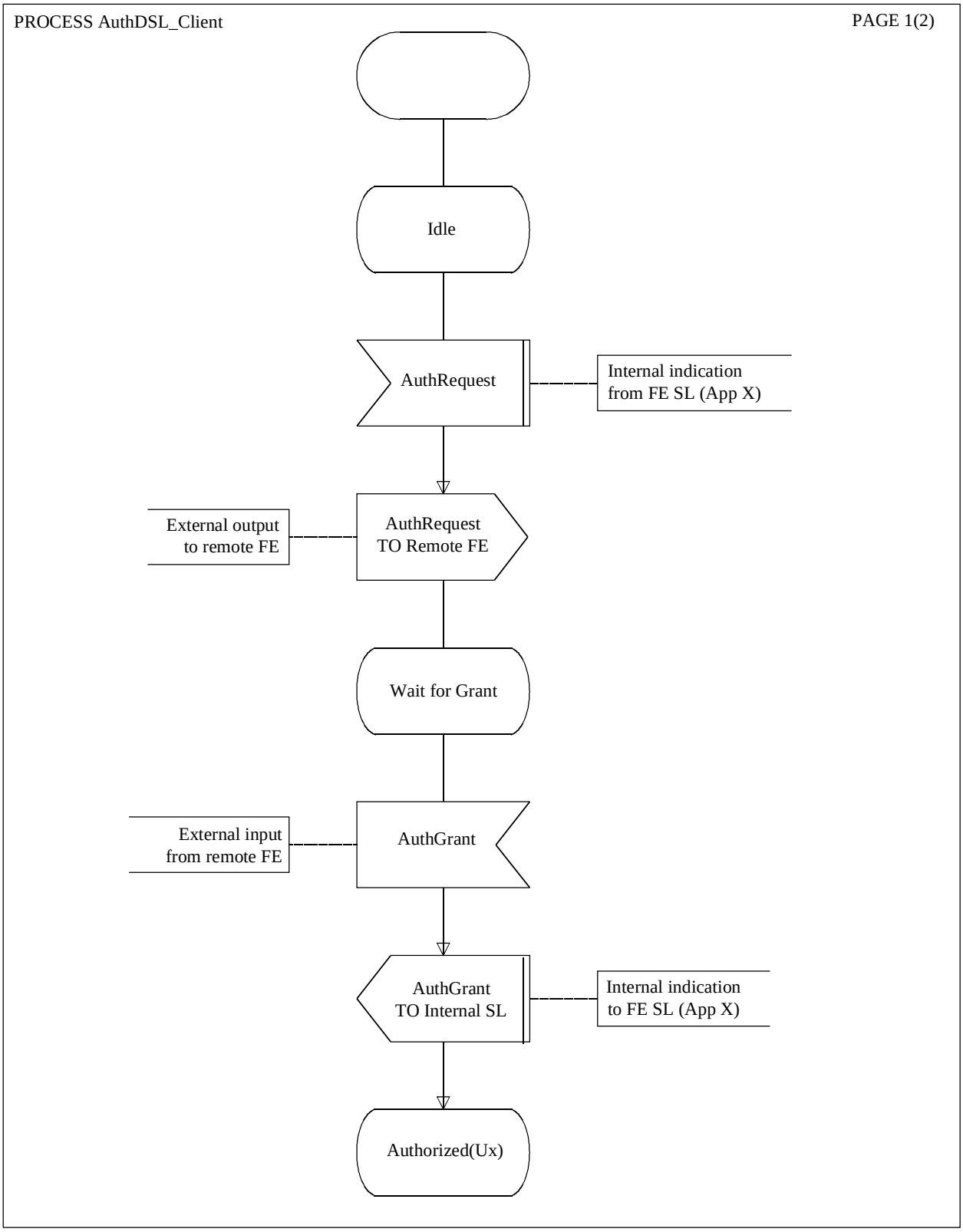
Specific information flow	Generic information flow			
	AuthRequest	**AuthGrant**	**AuthEnd**	**SIB**
SCF-SDF	Authenticate	Authenticate Result	End Authenticated Relationship	AUTHENTICATE
SCF-SCF	SCF Bind Request	SCF Bind Result	SCF Unbind Request	INITIATE SERVICE PROCESS, END
SDF-SDF	Authenticate	Authenticate Result	End Authenticated Relationship	AUTHENTICATE

11.1.6.4 Distributed Service Logic

The description of the DSL required to support the User Authentication and operation handling functions includes the processing required for handling the chaining and referral of operations. Each FE has a client process for each user on the requesting (outgoing) side of each interface. FEs other than the first (FE-A) have a corresponding server process for each user on the receiving (incoming) side of each interface to a client FE. These relationships are indicated in the information flow diagrams.

11.1.6.4.1 Client DSL – User Authentication and subsequent interaction

This subclause describes the DSL for handling User Authentication on the client side of an interface between FEs. See Figure 11-4.



T1185780-97

Figure 11-4/Q.1224 (sheet 1 of 2) – Client side of interaction between FEs

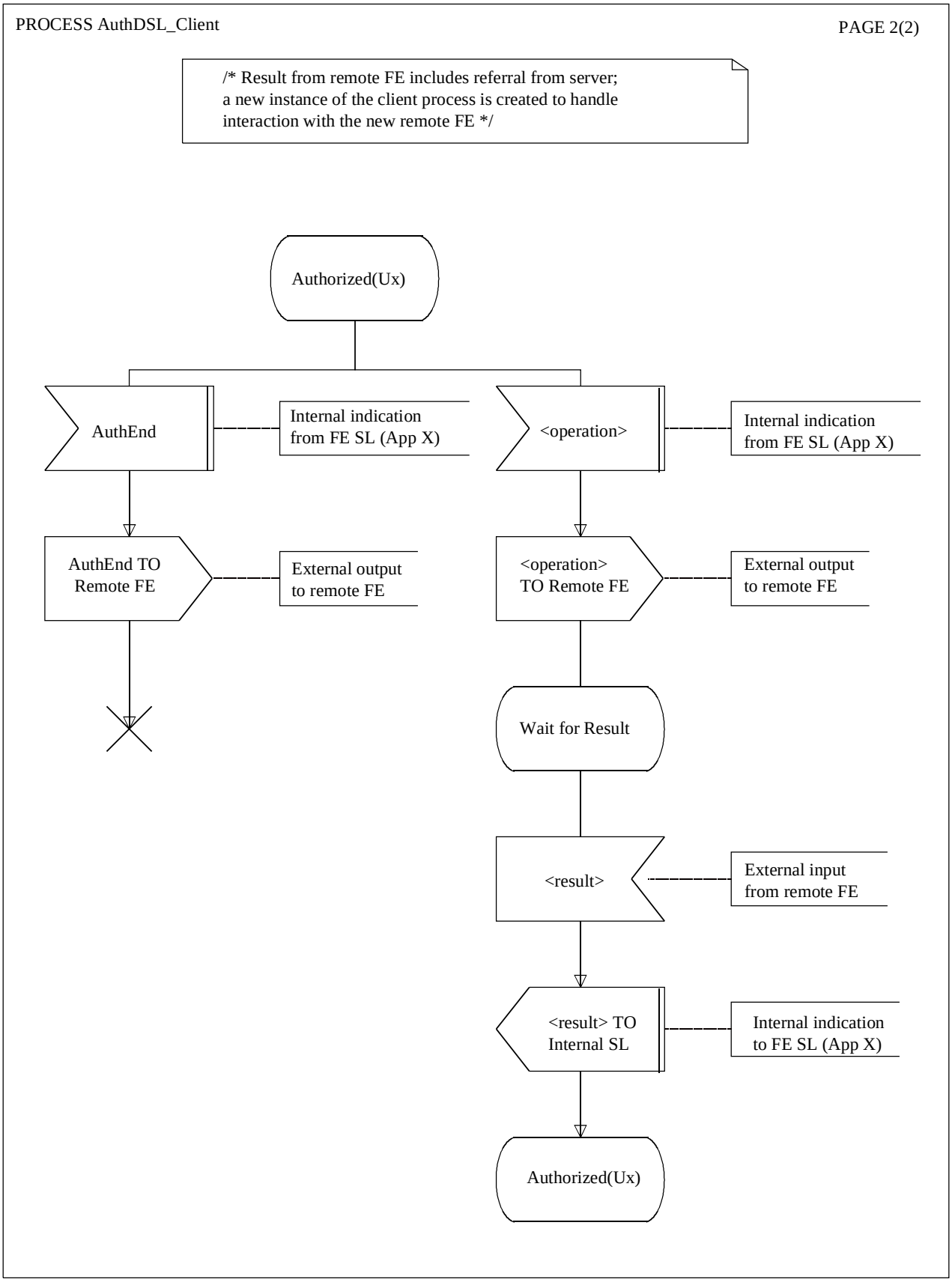


Figure 11-4/Q.1224 (sheet 2 of 2) – Client side of interaction between FEs

11.1.6.4.2 Incoming DSL – User Authentication and subsequent interaction

This subclause describes the DSL for handling User Authentication on the incoming side of an interface between FEs. See Figure 11-5.

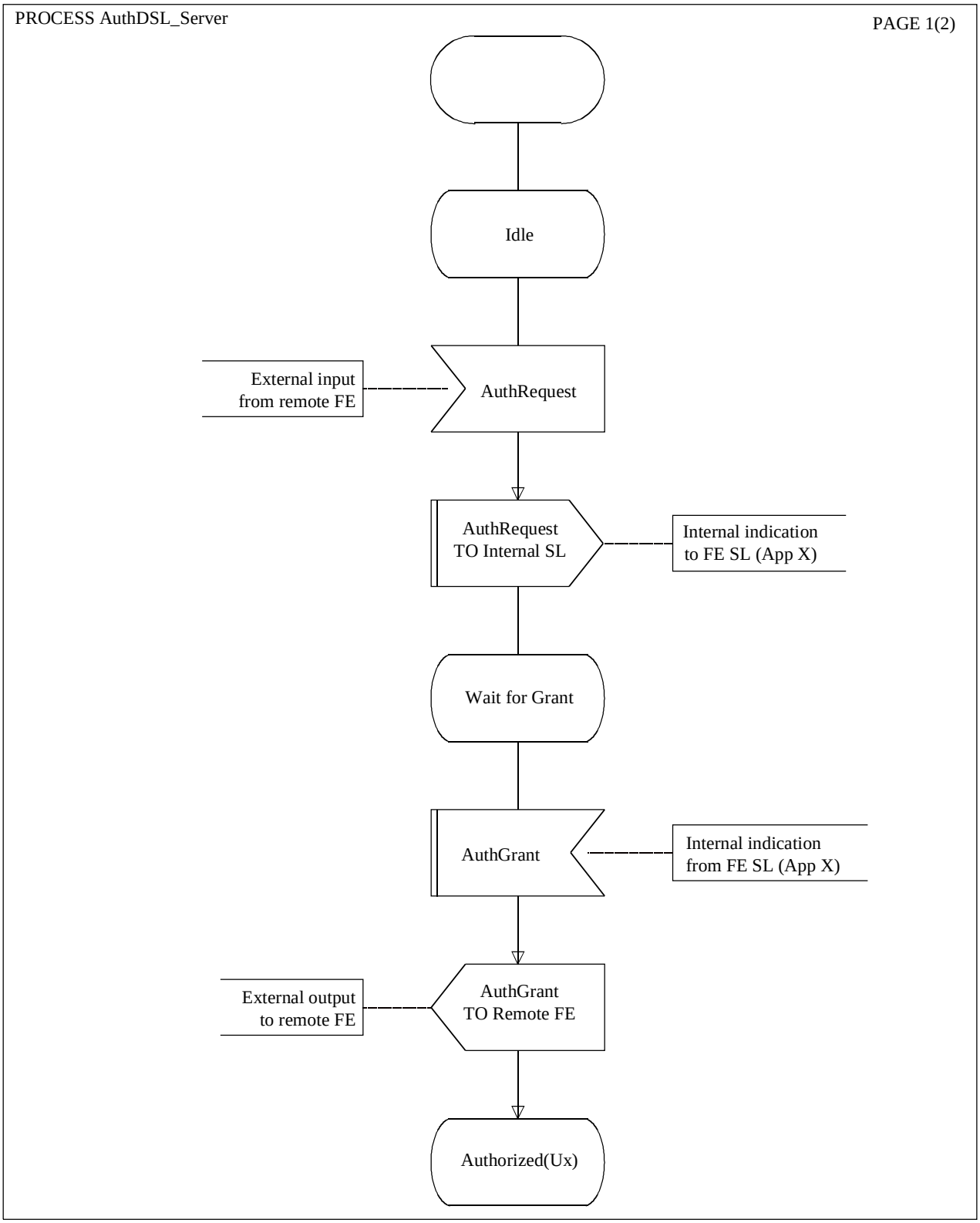


Figure 11-5/Q.1224 (sheet 1 of 2) – Server side of interaction between FEs

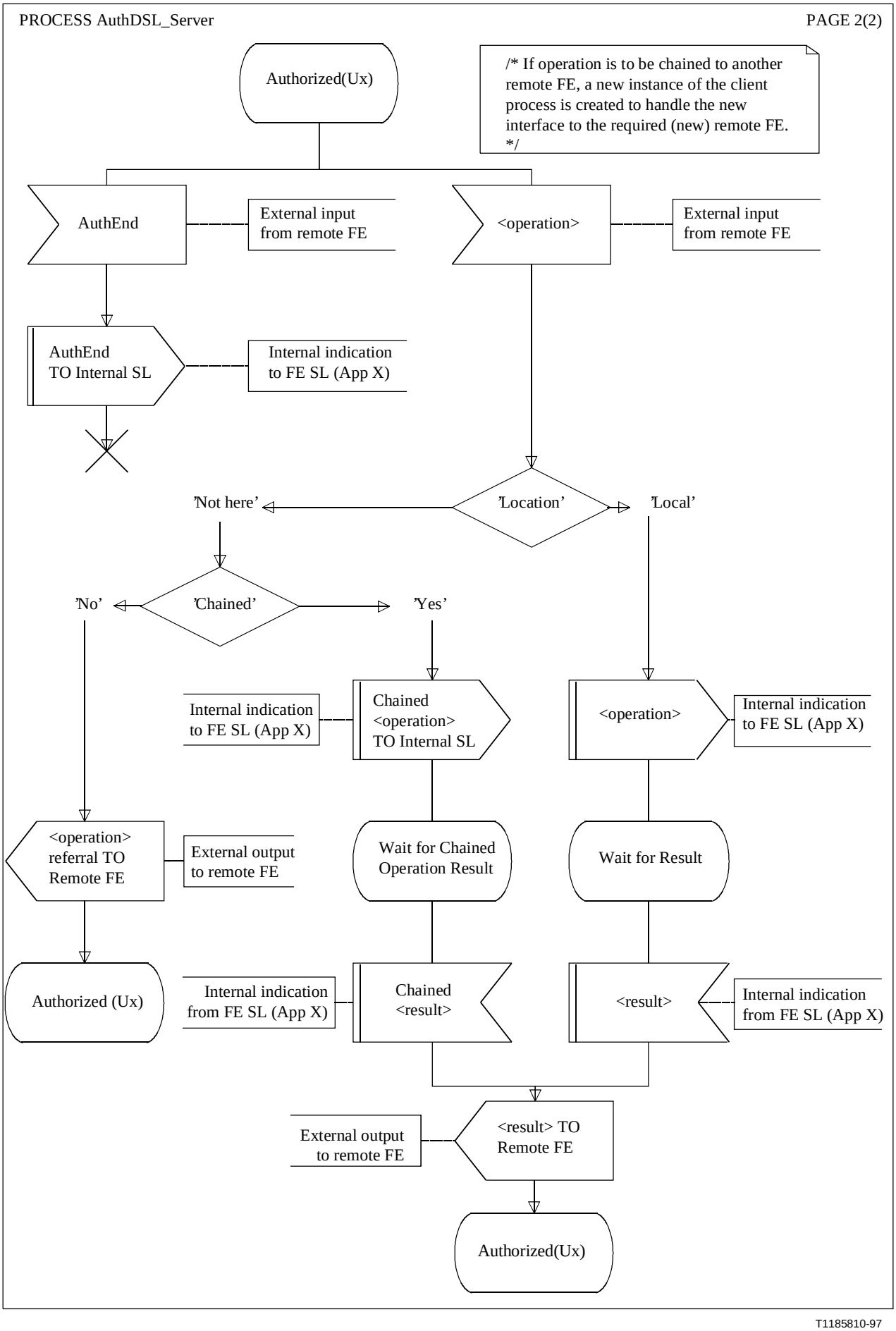


Figure 11-5/Q.1224 (sheet 2 of 2) – Server side of interaction between FEs

11.1.6.4.3 User Authentication with Operation Chaining

Operation Chaining occurs when the FE being requested to perform an operation is unable to comply with the request but is able to pass on the request to another FE which is able to process the operation request.

The information flows for a simple chaining operation exchange between three FEs are shown in Figure 11-6.

Any number of <operation> <result> pairs can be generated by FE-A to be processed by FE-B. When each operation arrives at FE-B it is examined to see if it can be handled locally. If not then the <operation> is chained to the appropriate FE-C (which may be different for each <operation>).

When the AuthEnd is received by FE-B it must be forwarded to all of the FE-C's which have been used to chain operations initiated by FE-A.

11.1.6.4.4 User Authentication with Operation Referral

Operation Referral occurs when the FE being requested to perform an operation is unable to comply with the request but is able to return the address of a FE which is able to perform the request. The originating FE is then responsible for contacting the referred FE directly to request the operation.

The information flows for a simple referral operation exchange between three FEs are shown in Figure 11-7.

Any number of <operation> <result> pairs can be generated by FE-A to be processed by FE-B. When each operation arrives at FE-B it is examined to see if it can be handled locally. If not then the <operation> is chained to the appropriate FE-C (which may be different for each <operation>).

When the AuthEnd is received by FE-B it must be forwarded to all of the FE-C's which have been used to chain operations initiated by FE-A.

11.1.7 SDF-SDF interactions

SDF to SDF interactions may be involved in all data access SIBs, i.e. SIBs which include an SCF to SDF relationship. If the SDF cannot perform the requested function it may pass on the request to another SDF.

Details of the authentication which must precede the establishment of an SDF-SDF relationship are contained in 11.17 and in the AUTHENTICATE SIB description in 11.2.2. The SERVICE DATA MANAGEMENT SIB description contains details of SDF to SDF interactions, which may also occur in LOG CALL INFORMATION, SCREEN and TRANSLATE SIBs.

Shadowing and copying of data is a matter for the physical plane only, and is not relevant in the DFP, as the DFP has no view of data replication.

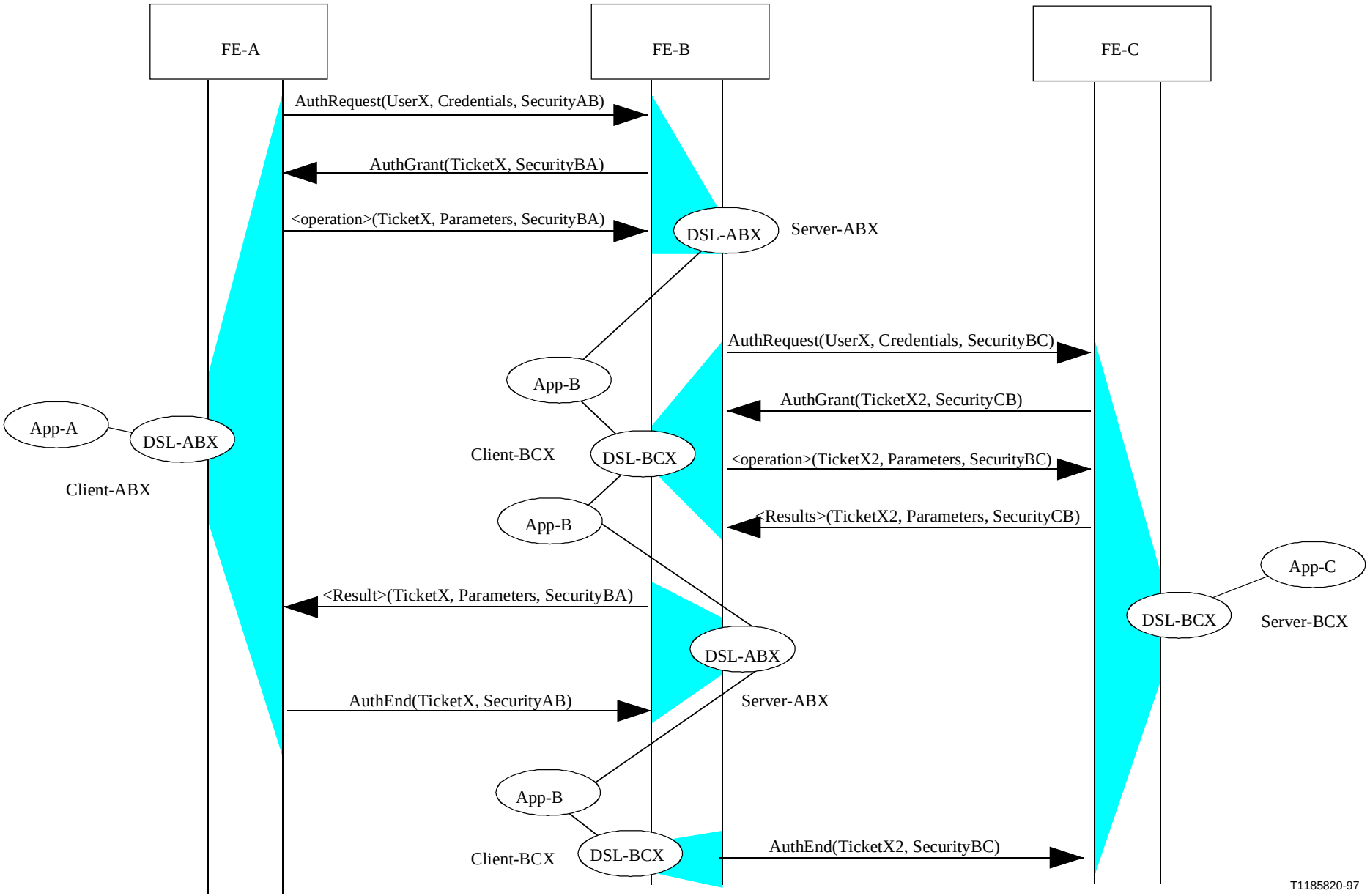


Figure 11-6/Q.1224 – User Authentication and operation chaining

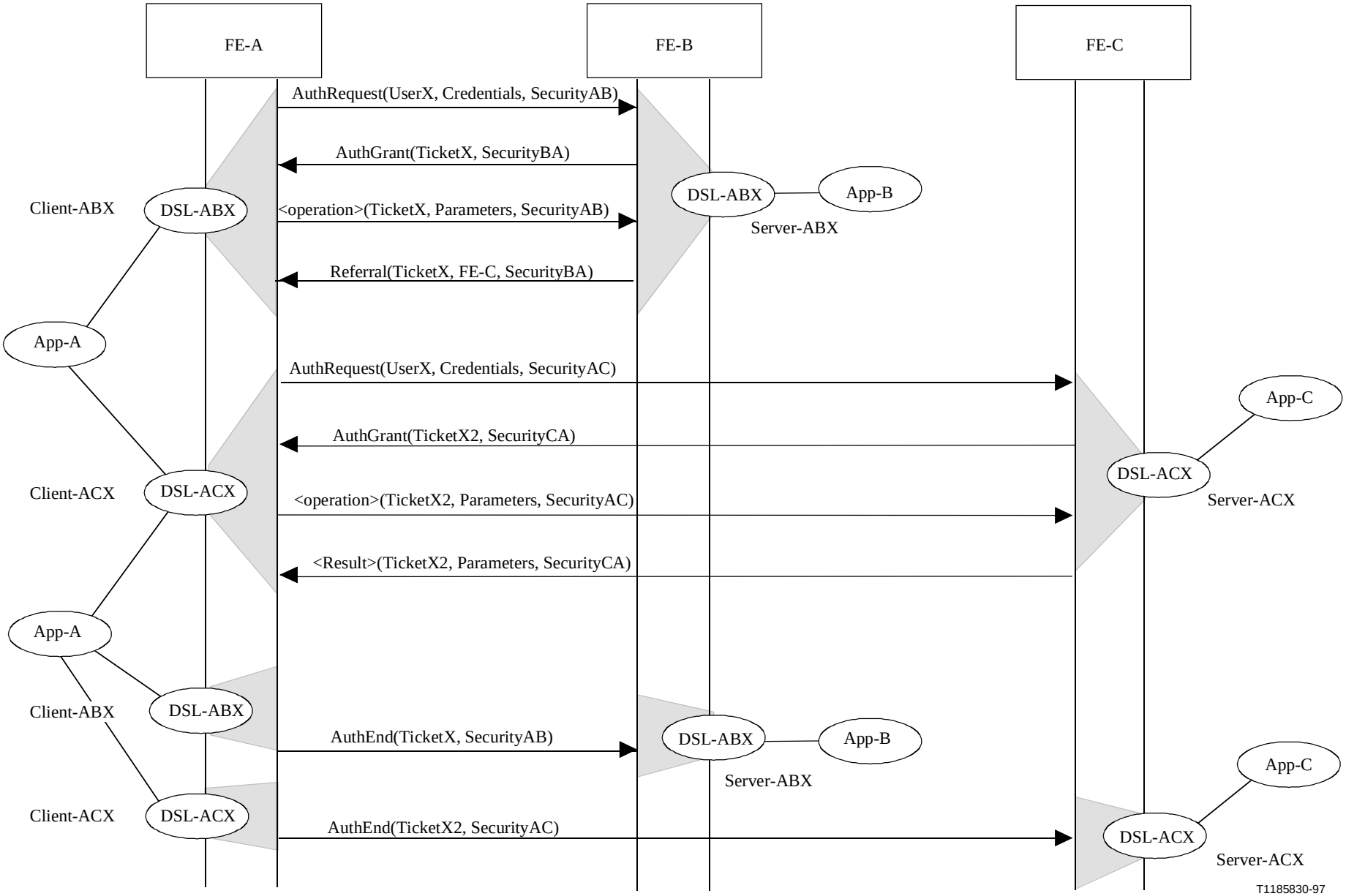


Figure 11-7/Q.1224 – User Authentication and operation referral

11.1.8 SCF-SCF interactions

SCF to SCF interactions take place between a controlling SCF and an assisting SCF. Via the INITIATE SERVICE PROCESS SIB, the controlling SCF establishes (SCF Bind Request, SCF Bind Result) a relationship with the assisting SCF, and indicates (Handling Information Request) that execution of service logic in the assisting SCF should commence.

During the life of the relationship, information flows take place corresponding to the MESSAGE HANDLER SIBs present in the service logics of the controlling and assisting SCF. The information flow for a particular pair of MESSAGE HANDLER SIBs is specified from the list of information flows contained in the MESSAGE HANDLER SIB definition. It should be noted that there are precedence rules for some of these information flows (e.g. Additional Information Result must be preceded by Provide Additional Information).

The END SIB denotes the termination of service logic execution in the assisting SCF. The SCF Unbind Request which terminates the SCF to SCF relationship proceeds from the END SIB in the controlling SCF to the END SIB in the assisting SCF.

Other information flows may take place between the SCFs which are unrelated to particular service features or SIB modelling.

11.2 SIB stage 2 descriptions

11.2.1 ALGORITHM SIB

11.2.1.1 Description

The ALGORITHM SIB provides the capability to apply a mathematical algorithm to data to produce a data result. This capability is provided, for IN CS-2, in the SCF as a part of the service logic for IN service features. As a result, no information flows are directly associated with this capability.

11.2.1.2 Information flow diagrams

No IFs are required for this SIB in IN CS-2.

11.2.1.3 SDLs

Figure 11-8 presents the SDL diagram for the SCF processing of the ALGORITHM SIB.

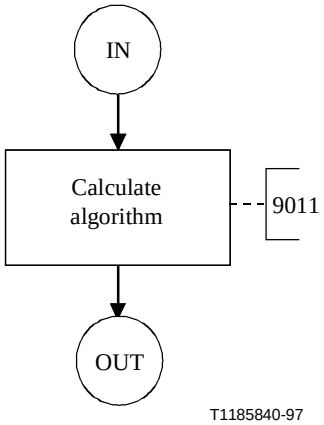


Figure 11-8/Q.1224 – SCF actions for the ALGORITHM SIB

11.2.1.4 Functional entity actions

SCF-related FEA

Reference number	*Action*
9011	Perform algorithm

11.2.2 AUTHENTICATE SIB

11.2.2.1 Description

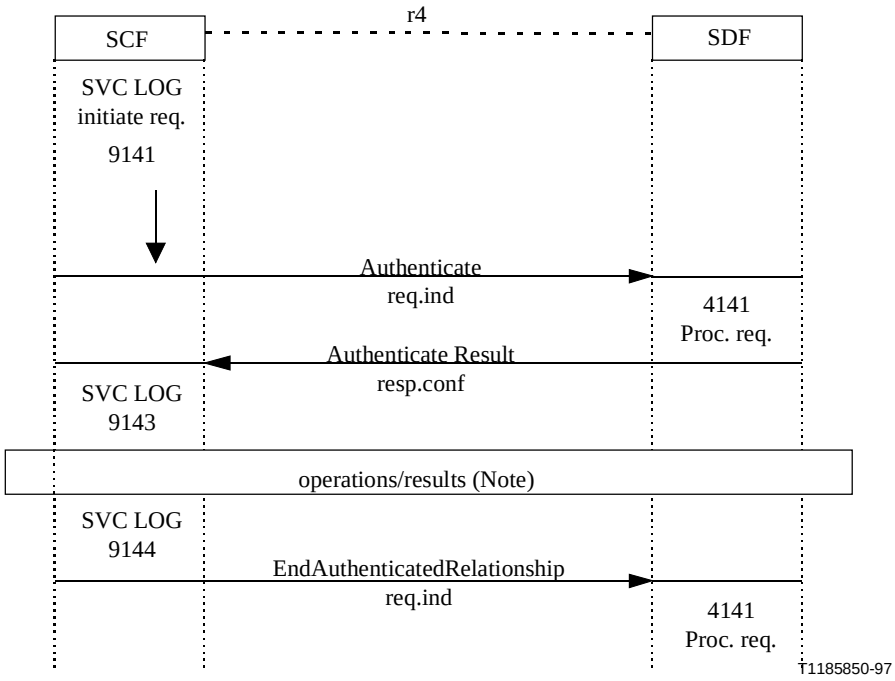
AUTHENTICATE SIB provides the capability for the SCF or the SDF to establish an authorized relationship between SCF-SDF or SDFs on behalf of a user by means of a requested authentication mechanism.

After an authenticated relationship has been established between the SCF and an SDF, an exchange of information flows (as described in SERVICE DATA MANAGEMENT SIB) will follow. If the SDF determines that chaining is required, the first chaining request must be preceded by the establishment of an authenticated relationship on behalf of the user between the first and second SDFs. Similarly, in the referral case, the authorized relationship must first be established between SCF and second SDF before the SDM IF information flows can be sent.

11.2.2.2 Information flow diagrams

1) *Information flow diagrams of User Authentication between two FEs*

Figure 11-9 depicts the information flows and functional entity actions to support authentication functionality between two FEs.

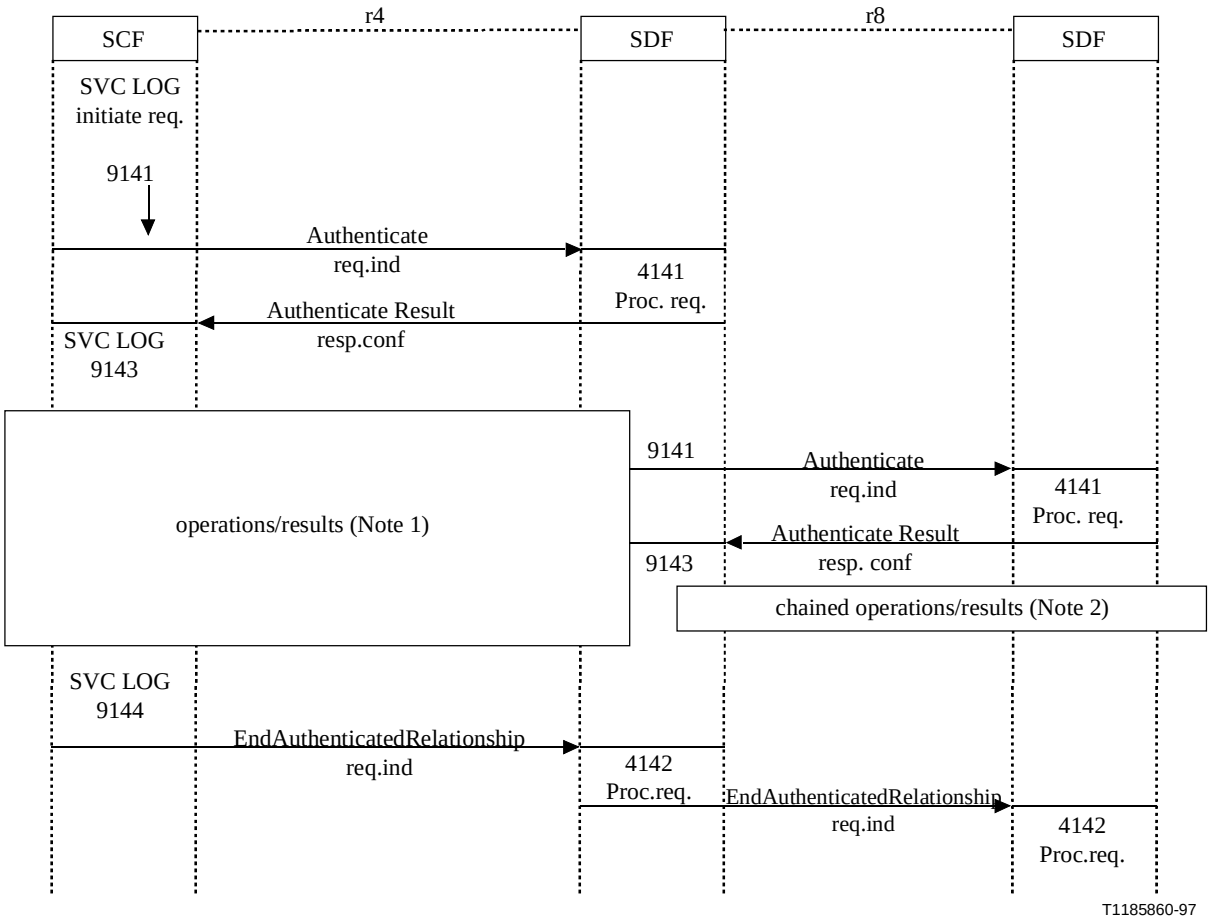


NOTE – Operations are Information Flows which have been occurring between two FEs.
It contains an identification of authenticated user and parameters required to perform the operations.
Results are also Information Flows which have been occurring between two FEs as the results of the operations.

Figure 11-9/Q.1224 – Information flow diagram AUTHENTICATE SIB (Simple)

2) *Information flow diagrams of User Authentication with Operation chaining*

Figure 11-10 depicts the information flows and functional entity actions to support authentication functionality with Operation Chaining.



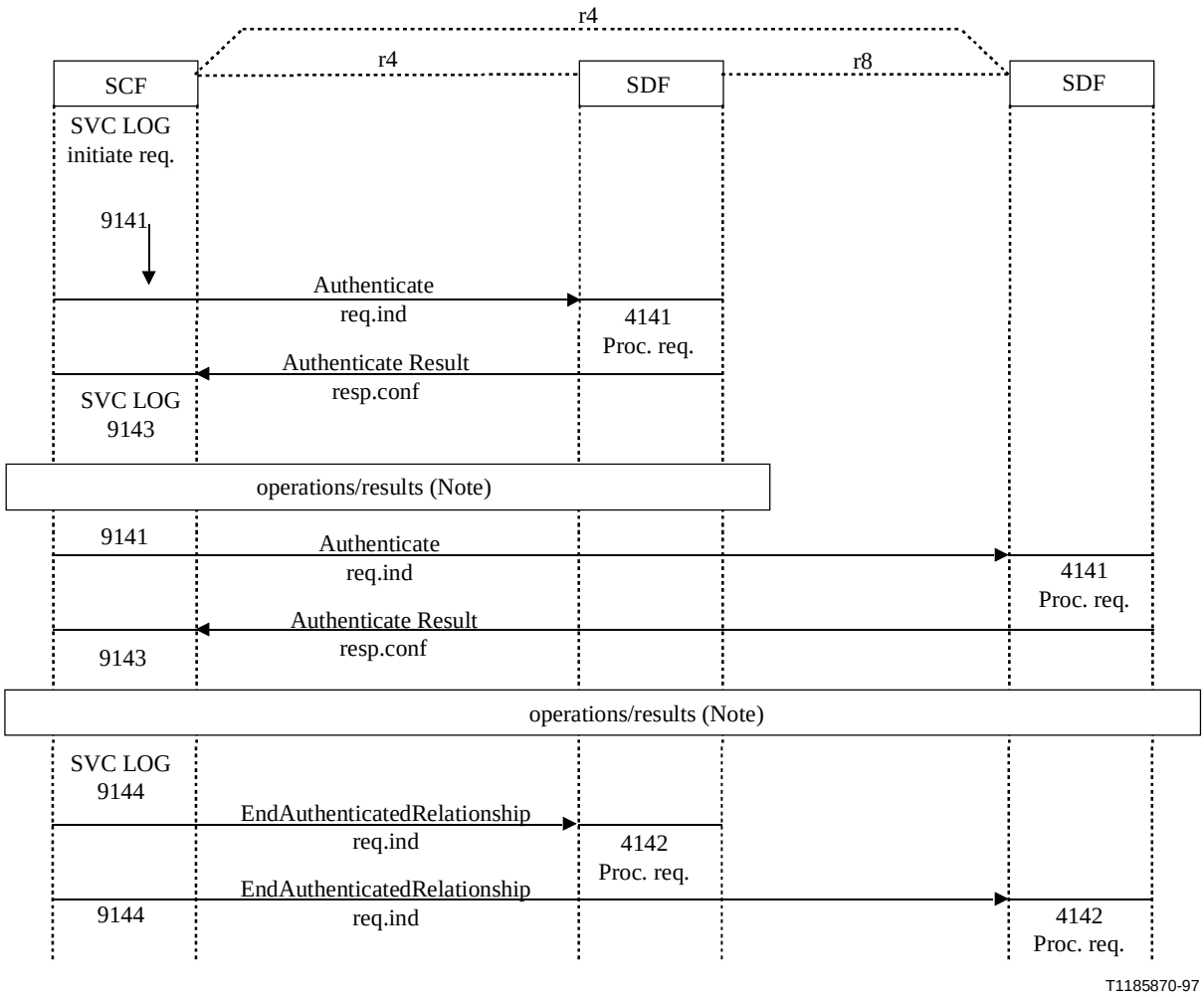
NOTE 1 – Operations are Information Flows which have been occurring between two FEs. It contains an identification of authenticated user and parameters required to perform the operations. Results are also Information Flows which have been occurring between two FEs as the results of the operations.

NOTE 2 – Chained Operations and Chained Results are chained Information Flows which have been occurring between two FEs.

Figure 11-10/Q.1224 – Information flow diagram AUTHENTICATE SIB with Operation Chaining

3) *Information flow diagrams of User Authentication with Operation Referral*

Figure 11-11 depicts the information flows and functional entity actions to support authentication functionality with Operation Referral.



NOTE – Operations are Information Flows which have been occurring between two FEs. It contains an identification of authenticated user and parameters required to perform the operations. Results are also Information Flows which have been occurring between two FEs as the results of the operations.

Figure 11-11/Q.1224 – Information flow diagram AUTHENTICATE SIB with Operation Referral

11.2.2.3 SDLs

Actions of two sides, claimant and verifier, are illustrated below. The claimant is a requester to authenticate with the remote FE. On the contrary, the verifier is a FE which checks the authenticity of the claimant. See Figures 11-12 and 11-13.

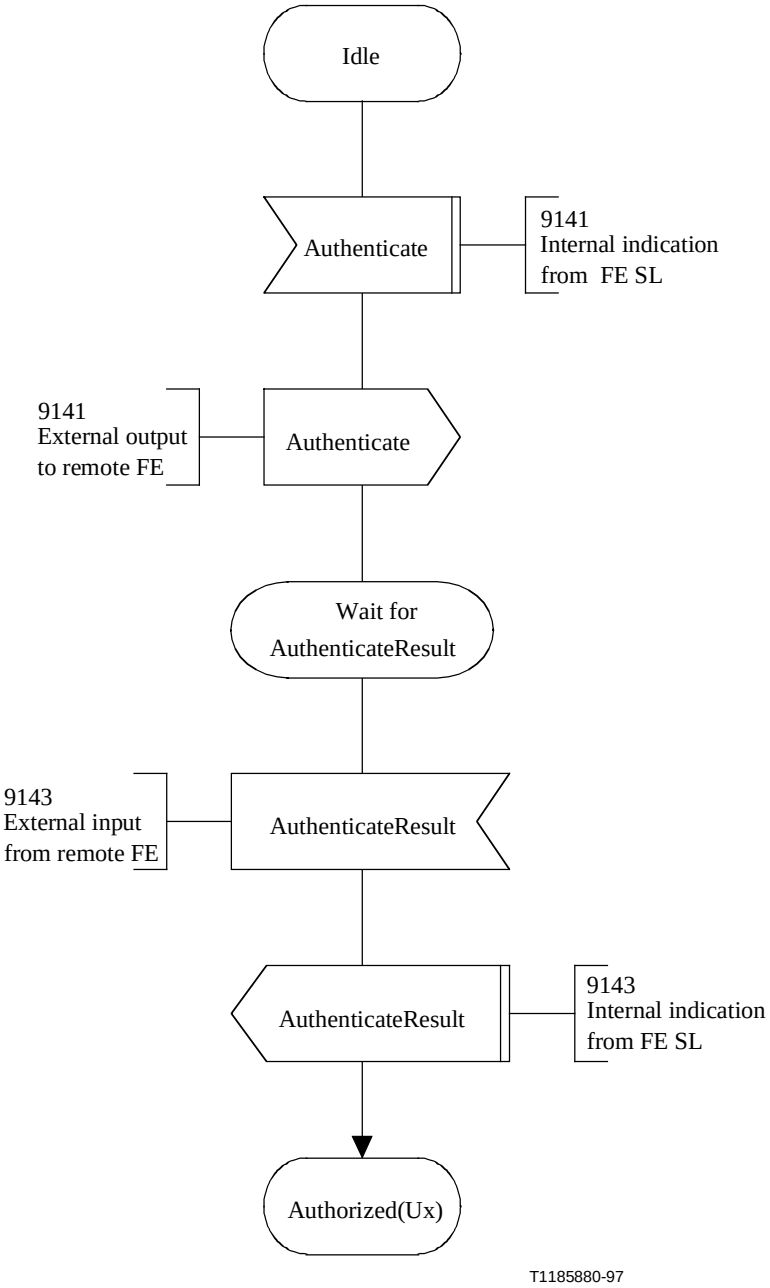


Figure 11-12/Q.1224 (sheet 1 of 2) – Claimant side of interaction between FEs, AUTHENTICATE SIB

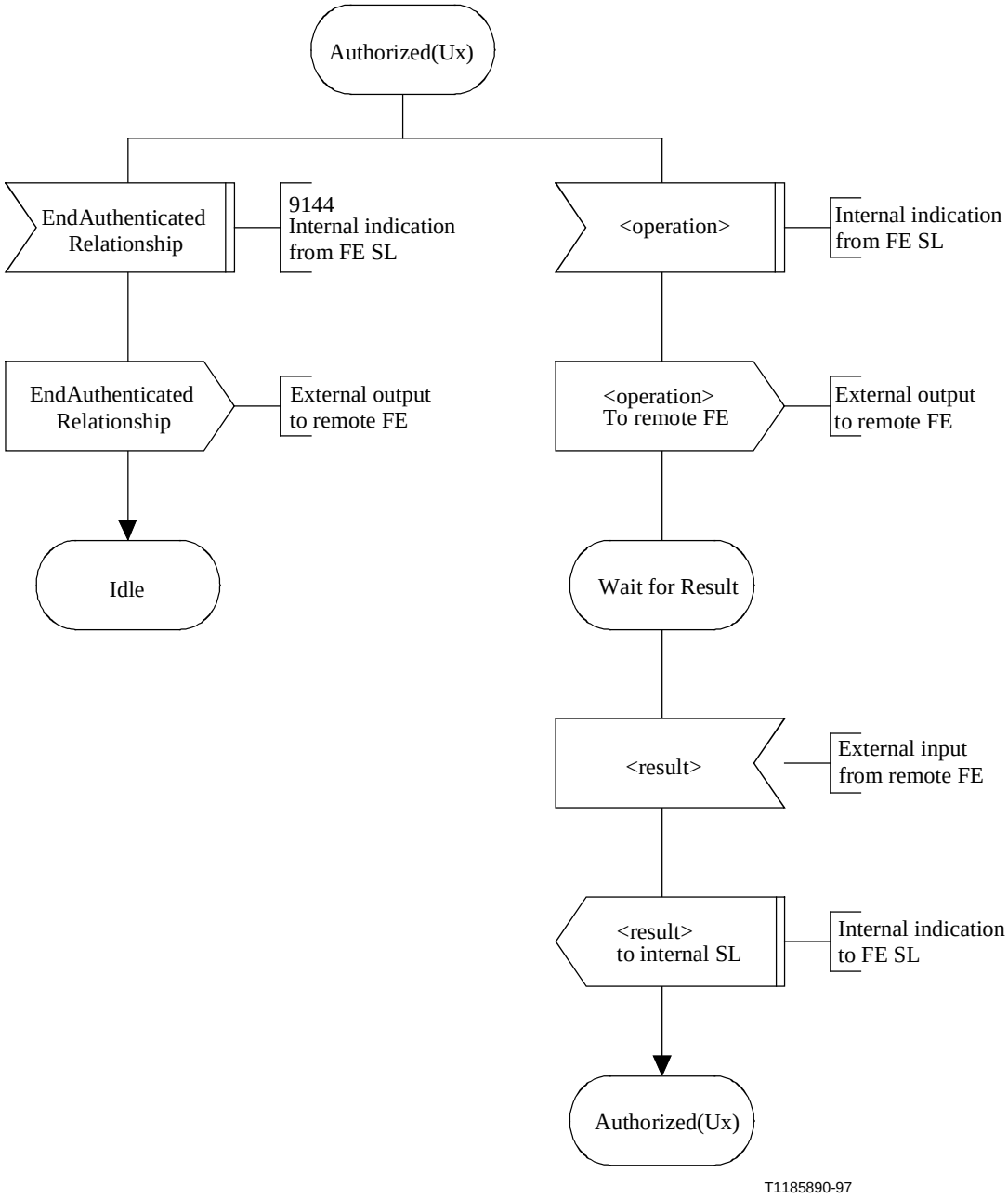


Figure 11-12/Q.1224 (sheet 2 of 2) – Claimant side of interaction between FEs, AUTHENTICATE SIB

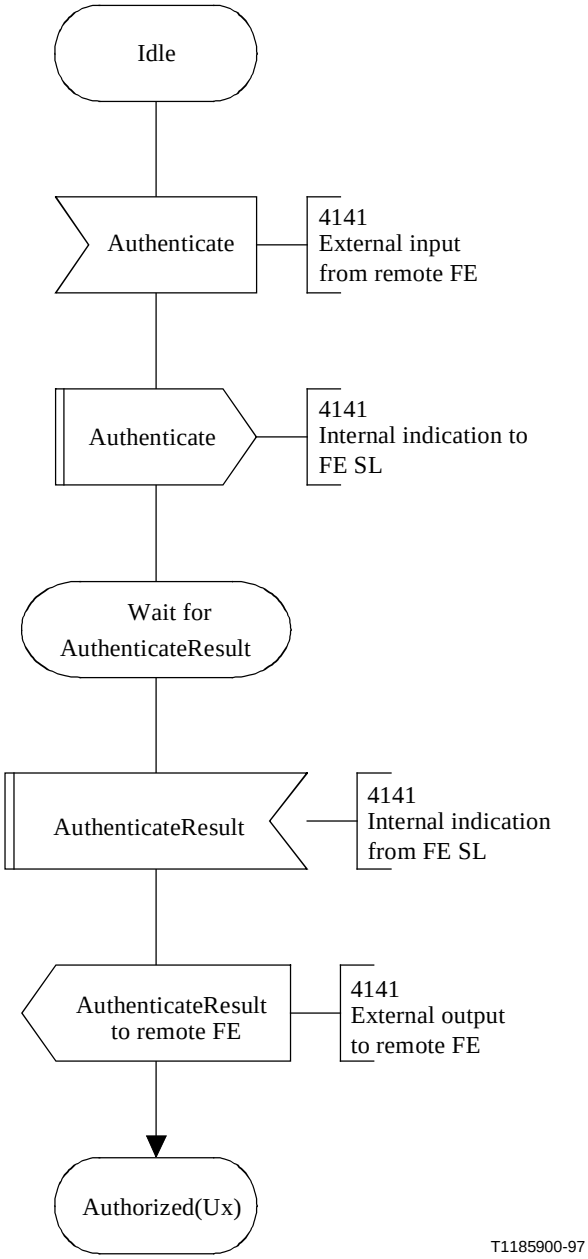


Figure 11-13/Q.1224 (sheet 1 of 2) – Verifier side of interaction between FEs, AUTHENTICATE SIB

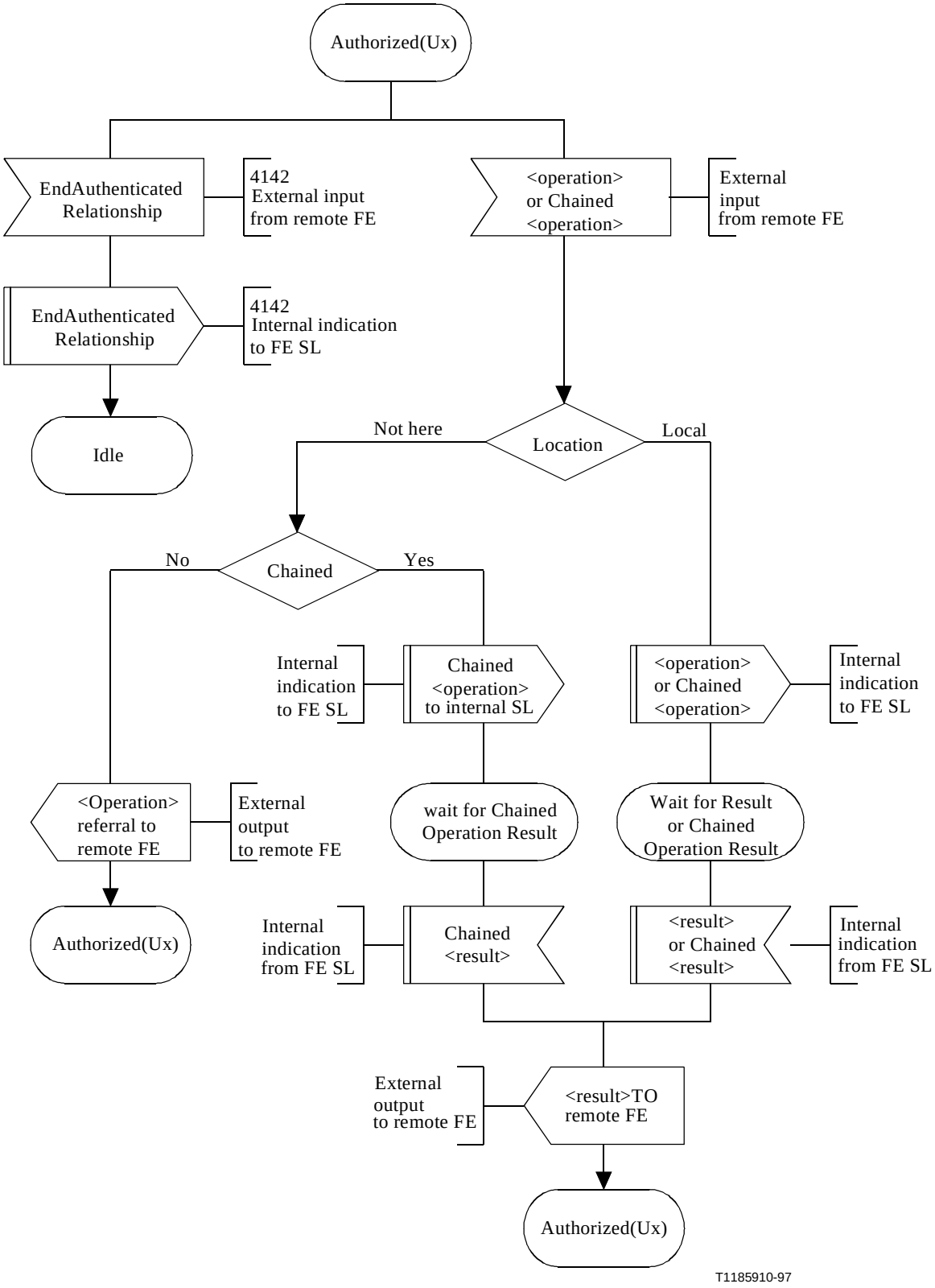


Figure 11-13/Q.1224 (sheet 2 of 2) – Verifier side of interaction between FEs, AUTHENTICATE SIB

11.2.2.4 Functional entity actions

SCF-related FEAs

Reference number	*Action*
9141	Process request from service logic
	– Generate and send an Authenticate
9143	Receive the Authenticate Result
	– Return response to service logic
9144	Process request from service logic
	– Generate and send an End Authenticated Relationship

SDF-related FEAs

Reference number	*Action*
4141	Receive and analyse the Authenticate
	– Authenticate the service logic
	– Generate and send an Authenticate Result
4142	Receive the End Authenticated Relationship
	– Internal indication to the service logic

11.2.3 CHARGE SIB

11.2.3.1 Description

The CHARGE SIB determines the special charging characteristics (e.g. special rate, reverse charge, split charging) that apply to calls related to IN-provided service features. Calls that do not request the assistance of IN functions (“non IN-provided calls”) are not affected by this SIB.

Four types of information flows are specified:

Type 1: supporting billing record generation at the SSF; the SCF is not involved in billing record storage.

Type 2: supporting sending charging information to the network charging functions.

Type 3: requesting notification of charging events detected at the SSF.

Type 4: requesting report of charge data which is generated at the SSF.

The CHARGE SIB also supports special charging treatment at the SCF; however, for this type of charging, all information related to IN-provided service features is available or can be made available to the SCF through other SIBs and no additional information flows or information elements are needed. The four types of information flows support different scenarios and may be used in any combination appropriate for a given service and a given network. Each charging information flow and each combination of charging information flows may be used multiple times during a call.

11.2.3.2 Information flow diagrams

Figure 11-14 depicts the information flows and functional entity actions to support type 1 charging functionality.

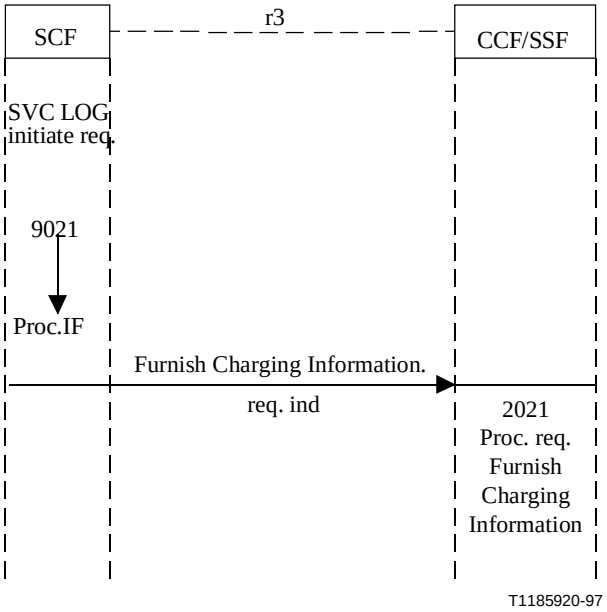


Figure 11-14/Q.1224 – Information flow diagram CHARGE SIB Type 1

Figure 11-15 depicts the information flows and functional entity actions to support type 2 charging functionality.

Figure 11-16 depicts the information flows and functional entity actions to support type 3 charging functionality.

Figure 11-17 depicts the information flows and functional entity actions to support type 4 charging functionality.

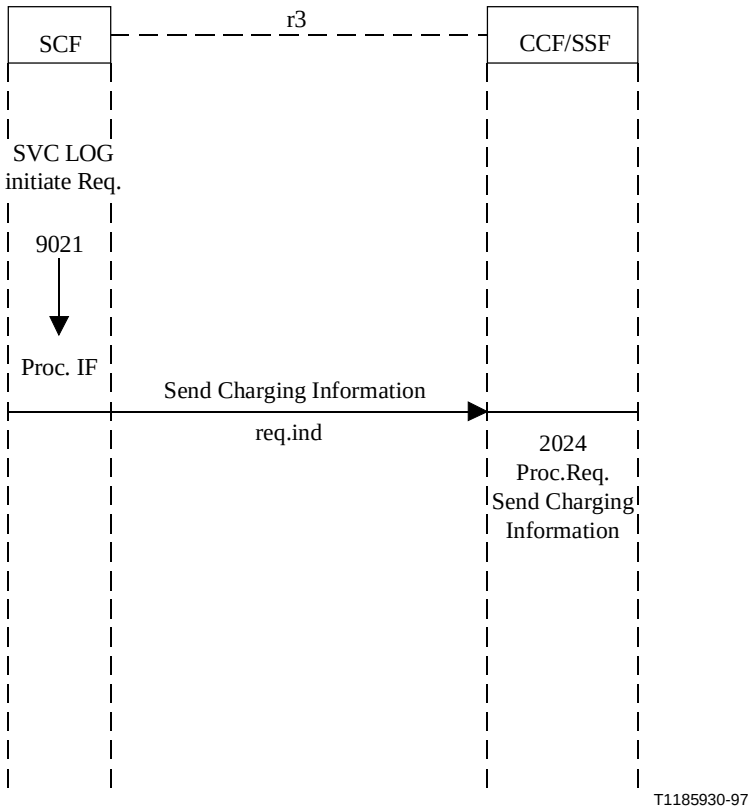


Figure 11-15/Q.1224 – Information flow diagram CHARGE SIB Type 2

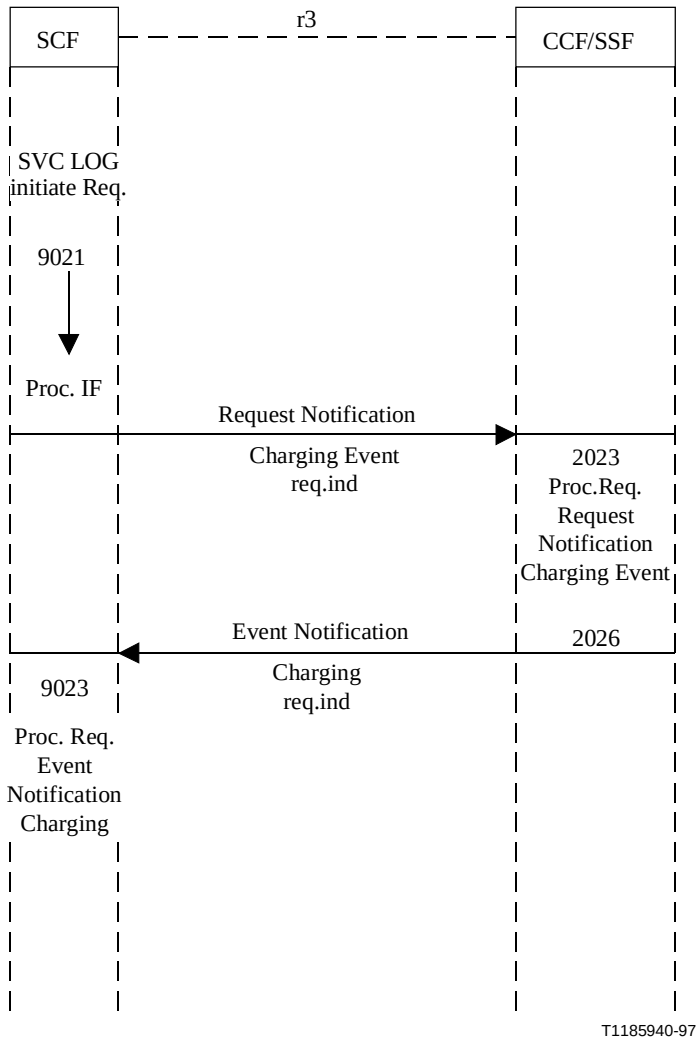
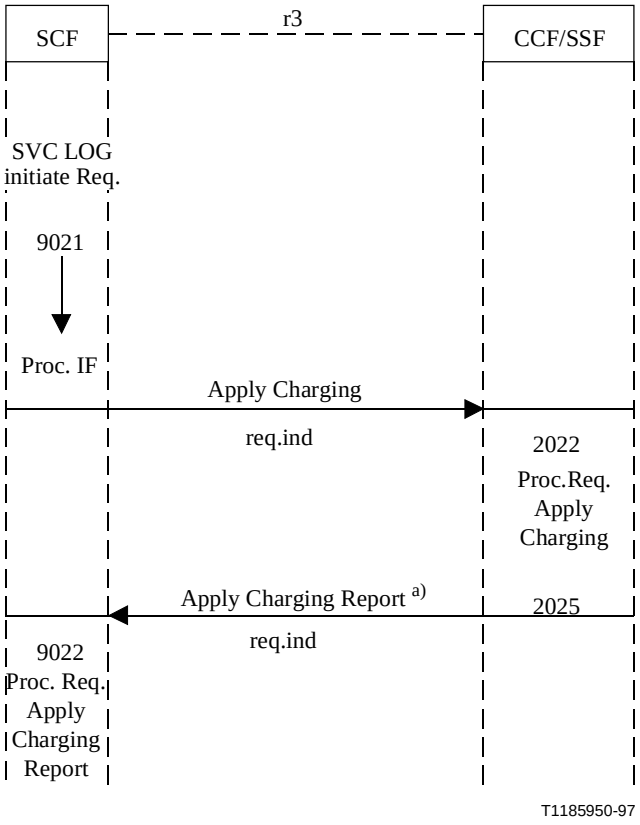


Figure 11-16/Q.1224 – Information flow diagram CHARGE SIB Type 3



a) Multiple Apply Charging Report req.inds can result from one Apply Charging req.ind.

Figure 11-17/Q.1224 – Information flow diagram CHARGE SIB Type 4

11.2.3.3 SDLs

Figures 11-18, 11-20, 11-22 and 11-24 present the SDL diagrams for the SCF processing of the CHARGE SIB functionality.

Figures 11-19, 11-21, 11-23 and 11-25 present the SDL diagrams for the CCF/SSF processing of the CHARGE SIB functionality.

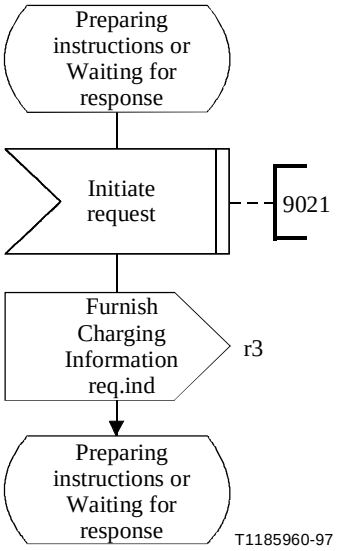


Figure 11-18/Q.1224 – SCF actions for the CHARGE SIB Type 1

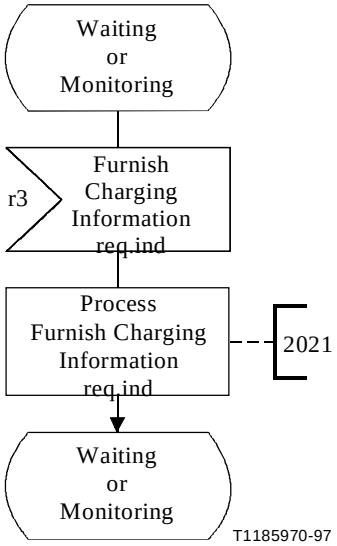


Figure 11-19/Q.1224 – CCF/SSF actions for the CHARGE SIB Type 1

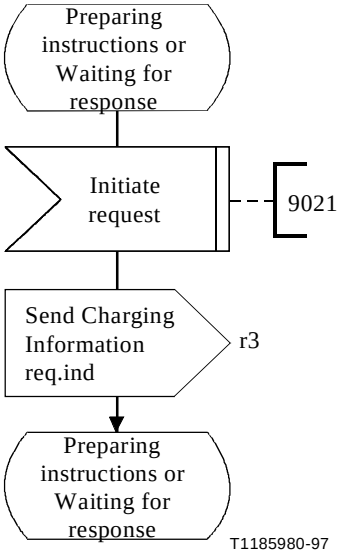


Figure 11-20/Q.1224 – SCF actions for the CHARGE SIB Type 2

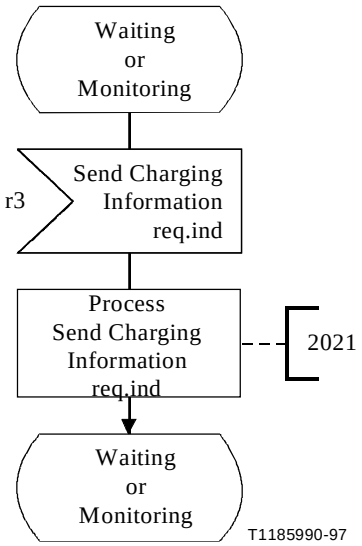


Figure 11-21/Q.1224 – CCF/SSF actions for the CHARGE SIB Type 2

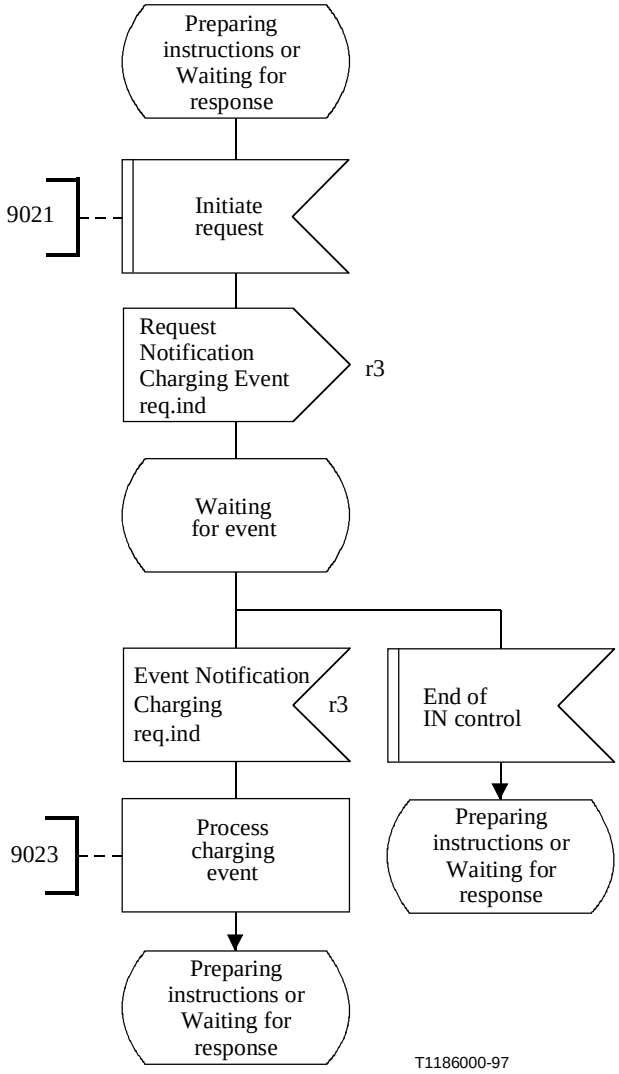


Figure 11-22/Q.1224 – SCF actions for the CHARGE SIB Type 3

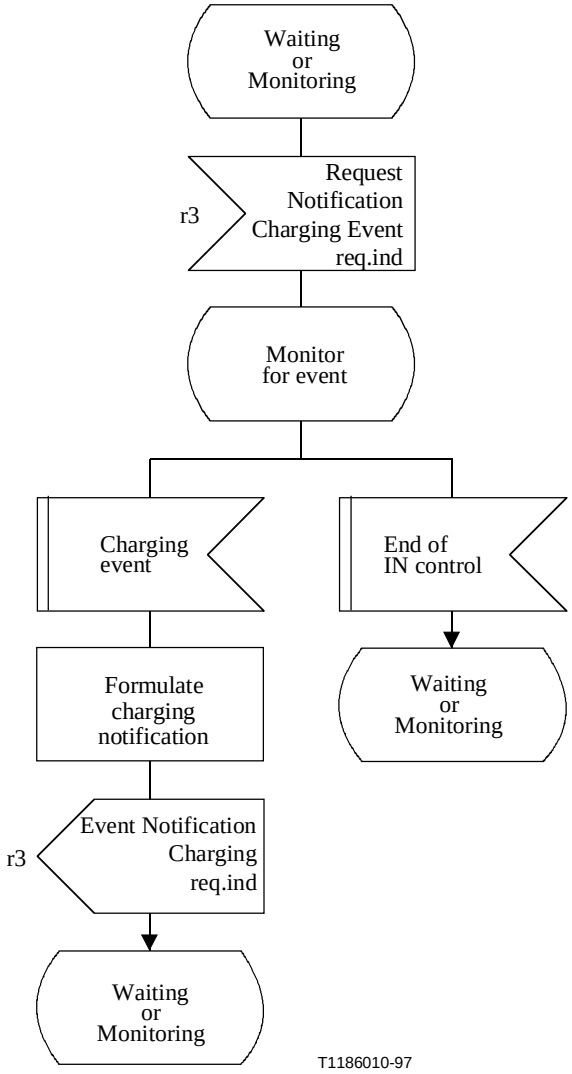


Figure 11-23/Q.1224 – CCF/SSF actions for the CHARGE SIB Type 3

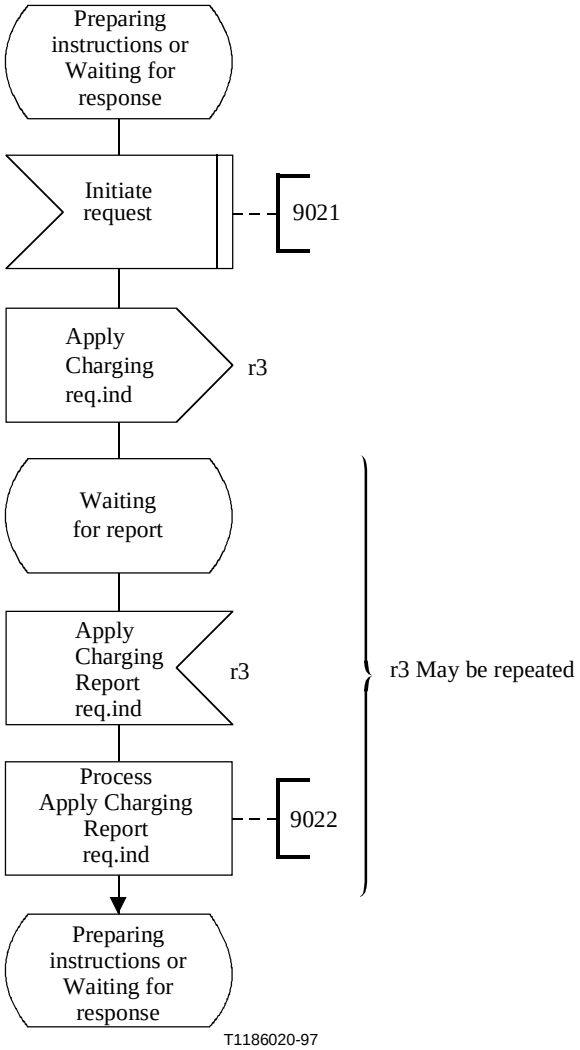


Figure 11-24/Q.1224 – SCF actions for the CHARGE SIB Type 4

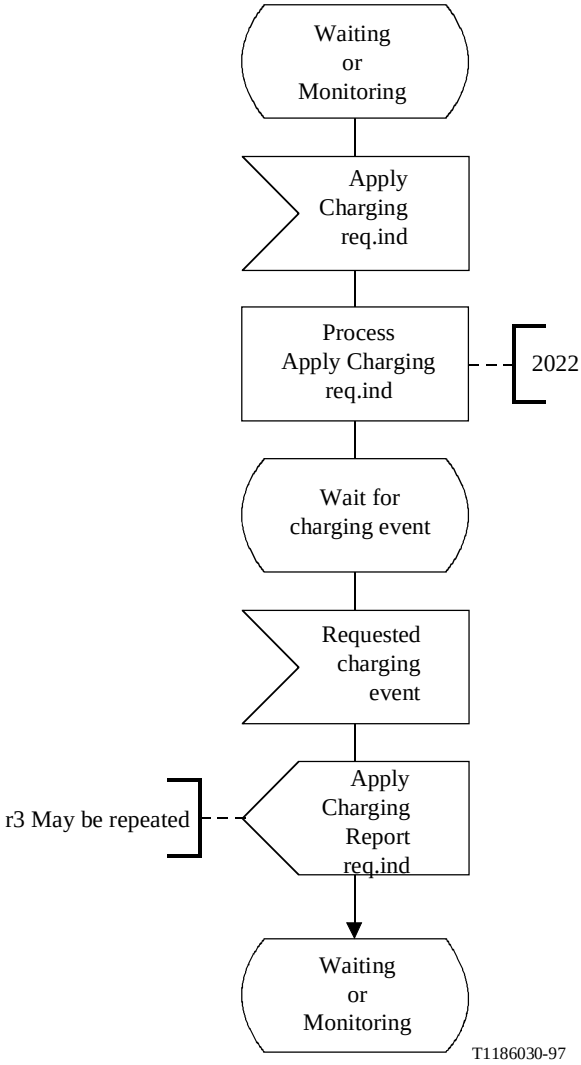


Figure 11-25/Q.1224 – CCF/SSF actions for the CHARGE SIB Type 4

11.2.3.4 Functional entity actions

SCF-related FEAs

Reference number	*Action*
9021	Initiate request – Initiate a Furnish Charging Information req.ind; or – Initiate an Apply Charging req.ind and await a response; or – Initiate a Request Notification Charging Event req.ind and await a response; or – Initiate a Send Charging Information req.ind
9022	Process Apply Charging Report req.ind
9023	Process Event Notification Charging req.ind

SSF-related FEAs

Reference number	*Action*
2021	Process Furnish Charging Information req.ind
	– Receive and analyse Furnish Charging Information req.ind
	– Apply specified furnish charging information procedures
2022	Process Apply Charging req.ind
	– Receive and analyse Apply Charging req.ind
	– Apply specified apply charging procedures (e.g. generate pulses)
2023	Process Request Notification Charging Event req.ind
	– Receive and analyse Request Notification Charging Event req.ind
	– Apply specified request notification charging event procedures
	– Monitor for specified charging event
2024	Process Send Charging Information req.ind
	– Receive and analyse Send Charging Information req.ind
	– Apply specified send charging information procedures
2025	On detection of specified charging event
	– Return an Apply Charging Report req.ind
2026	On detection of specified charging event
	– Send Event Notification Charging req.ind

11.2.4 COMPARE SIB

11.2.4.1 Description

The COMPARE SIB provides the capability to compare an identifier against a specified reference value and will return one of three possible solutions, (<, >, or =). This capability is provided, for IN CS-2, in the SCF as a part of the service logic for IN service features. As a result, no information flows are directly associated with this capability.

11.2.4.2 Information flow diagrams

No IFs are required for this SIB in IN CS-2.

11.2.4.3 SDLs

Figure 11-26 presents the SDL diagram for the SCF processing of the COMPARE SIB.

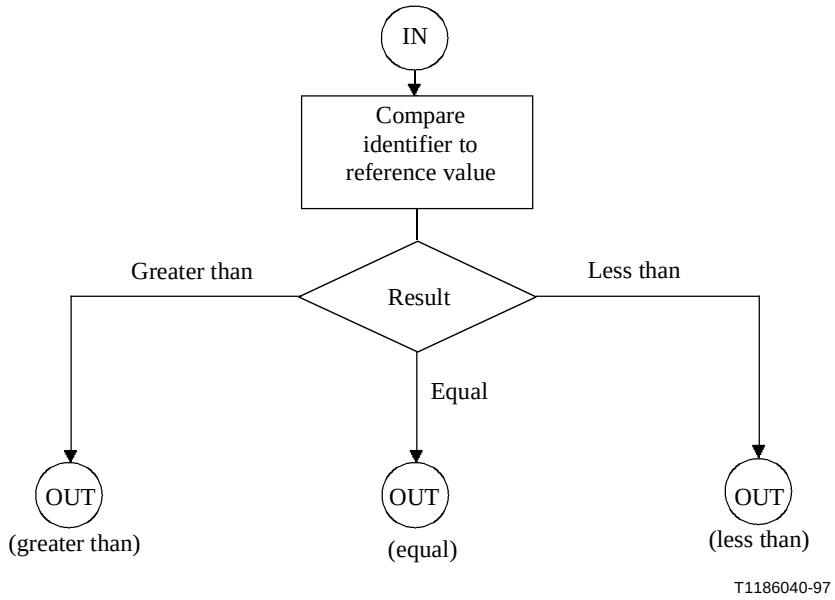


Figure 11-26/Q.1224 – SCF actions for the COMPARE SIB

11.2.4.4 Functional entity actions

SCF-related FEA

Reference number	*Action*
9031	Perform compare

11.2.5 DISTRIBUTION SIB

11.2.5.1 Description

The DISTRIBUTION SIB provides the capability to distribute calls to different logical ends dependent on user specified parameters. The results of this SIB will provide one of several predefined logical destinations to which the call should be directed for completion. This capability is provided, for IN CS-2, in the SCF as a part of the service logic for IN service features. As a result, no information flows are directly associated with this capability.

11.2.5.2 Information flow diagrams

No IFs are required for this SIB in IN CS-2.

11.2.5.3 SDLs

Figure 11-27 presents the SDL diagram for the SCF processing of the DISTRIBUTION SIB.

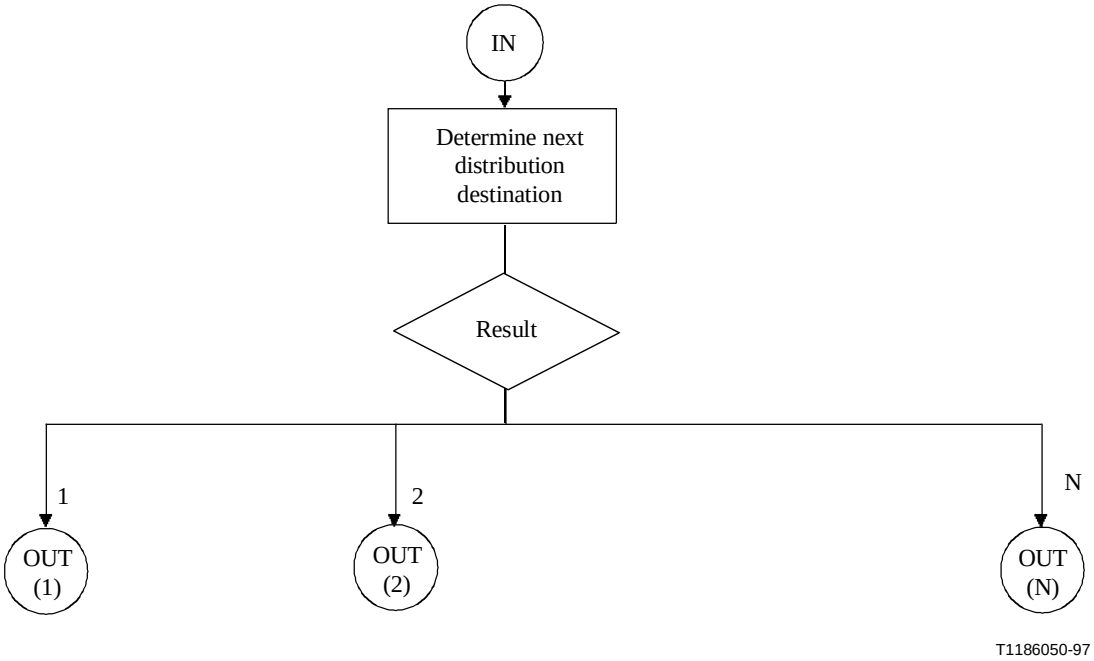


Figure 11-27/Q.1224 – SCF actions for the DISTRIBUTION SIB

11.2.5.4 Functional entity actions

SCF-related FEA

Reference number	*Action*
9041	Perform distribution

11.2.6 END SIB

11.2.6.1 Description

The END SIB can only follow a MESSAGE HANDLER SIB. It indicates the conclusion of parallel processing in a supporting service process, and completes the unbind operation initiated by the controlling service process.

11.2.6.2 Information flow diagrams

Figure 11-28 depicts information flows and functional entity actions involved in execution of the END SIB for terminating parallel service processing in the supporting SCF. Figure 11-29 depicts information flows and functional entity actions involved in execution of the END SIB in the chaining case, for terminating parallel service processing in the chaining initiator supporting SCF and the chaining terminator supporting SCF.

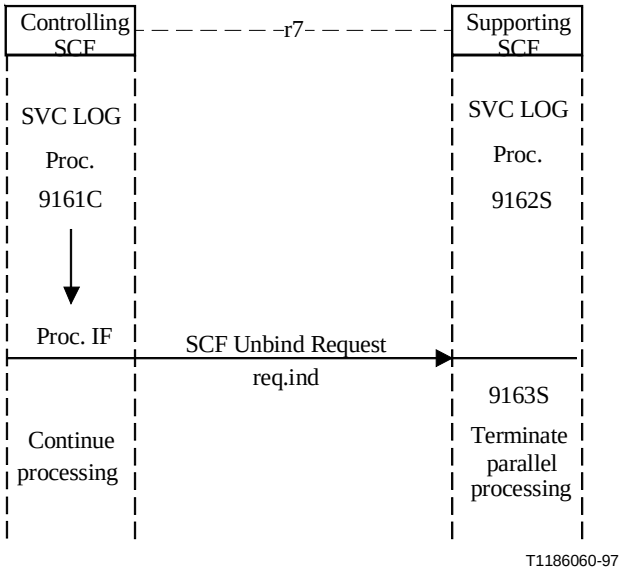


Figure 11-28/Q.1224 – Information flow diagram for END SIB

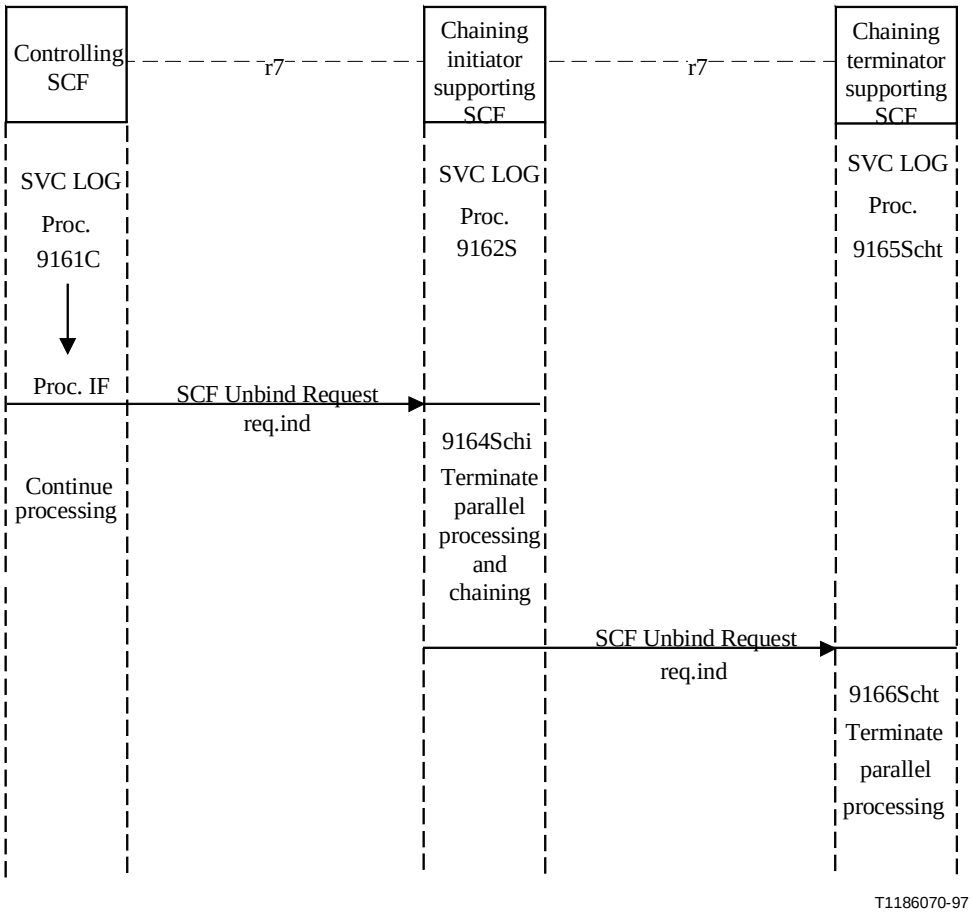


Figure 11-29/Q.1224 – Information flow diagram for END SIB, chaining case

11.2.6.3 SDLs

Figure 11-30 presents the SDL diagram for the controlling and supporting SCF processing of the END SIB, including chaining.

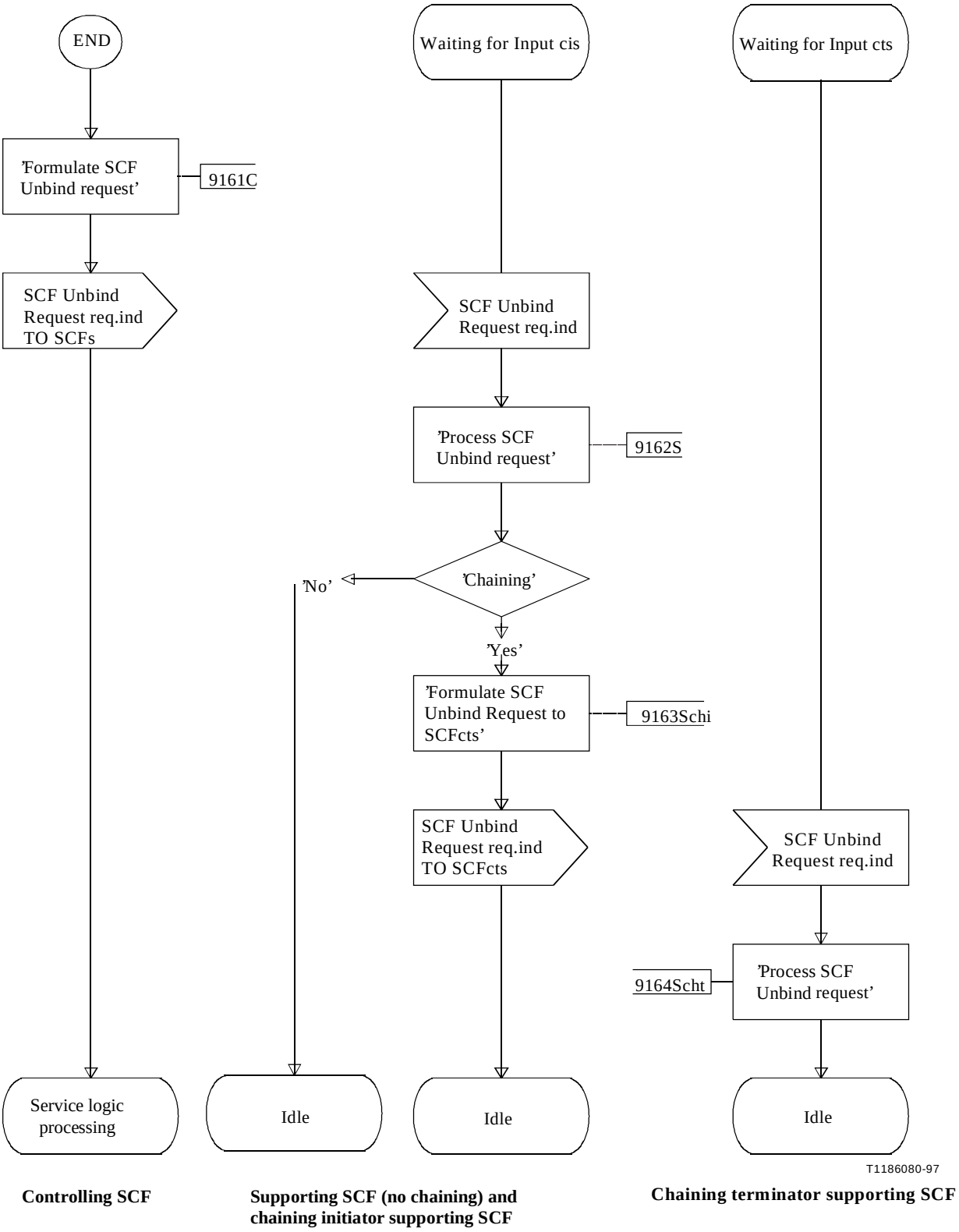


Figure 11-30/Q.1224 – Controlling and supporting SCF actions for END SIB, including chaining

11.2.6.4 Functional entity actions

The character "C" is appended to functional entity action numbers for the controlling SCF and the character "S" is appended to functional entity action numbers for the supporting SCF. For the chaining case, the characters "Schi" are appended to functional entity action numbers for the chaining initiator supporting SCF and the characters "Scht" are appended for the chaining terminator supporting SCF.

Controlling SCF-related FEA

Reference number	*Action*
9161C	Formulate and send SCF Unbind Request and continue processing

Supporting SCF-related FEAs

Reference number	*Action*
9162S	Process SCF Unbind Request from controlling SCF and terminate processing
9163Schi	Prepare SCF Unbind Request to chaining terminator supporting SCF – Terminate processing
9164Scht	Process SCF Unbind Request from chaining initiator supporting SCF – Terminate processing

11.2.7 INITIATE SERVICE PROCESS SIB

11.2.7.1 Description

INITIATE SERVICE PROCESS is a SIB wherein the controlling SCF requests the invocation of service logic execution in the supporting SCF to perform predefined actions. Communication between the service logic in the controlling SCF and the service logic in the supporting SCF is established via an authenticated relation between the SCFs. The INITIATE SERVICE PROCESS SIB must be followed by a MESSAGE HANDLER SIB.

11.2.7.2 Information flow diagrams

Figure 11-31 depicts information flows and functional entity actions involved in execution of the INITIATE SERVICE PROCESS SIB for initiating service logic execution within another SCF. Figure 11-32 shows the case of referral from one supporting SCF to another, and Figure 11-33 shows the chaining case.

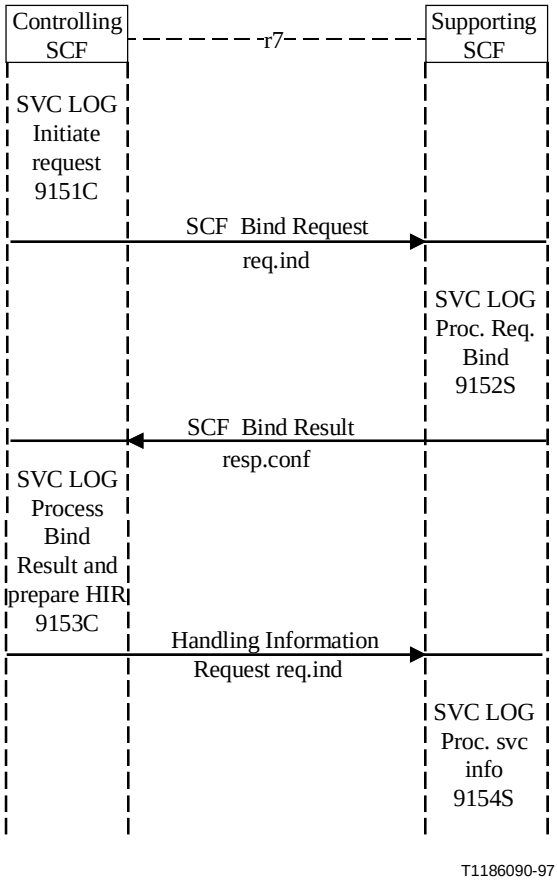


Figure 11-31/Q.1224 – Information flow diagram INITIATE SERVICE PROCESS SIB

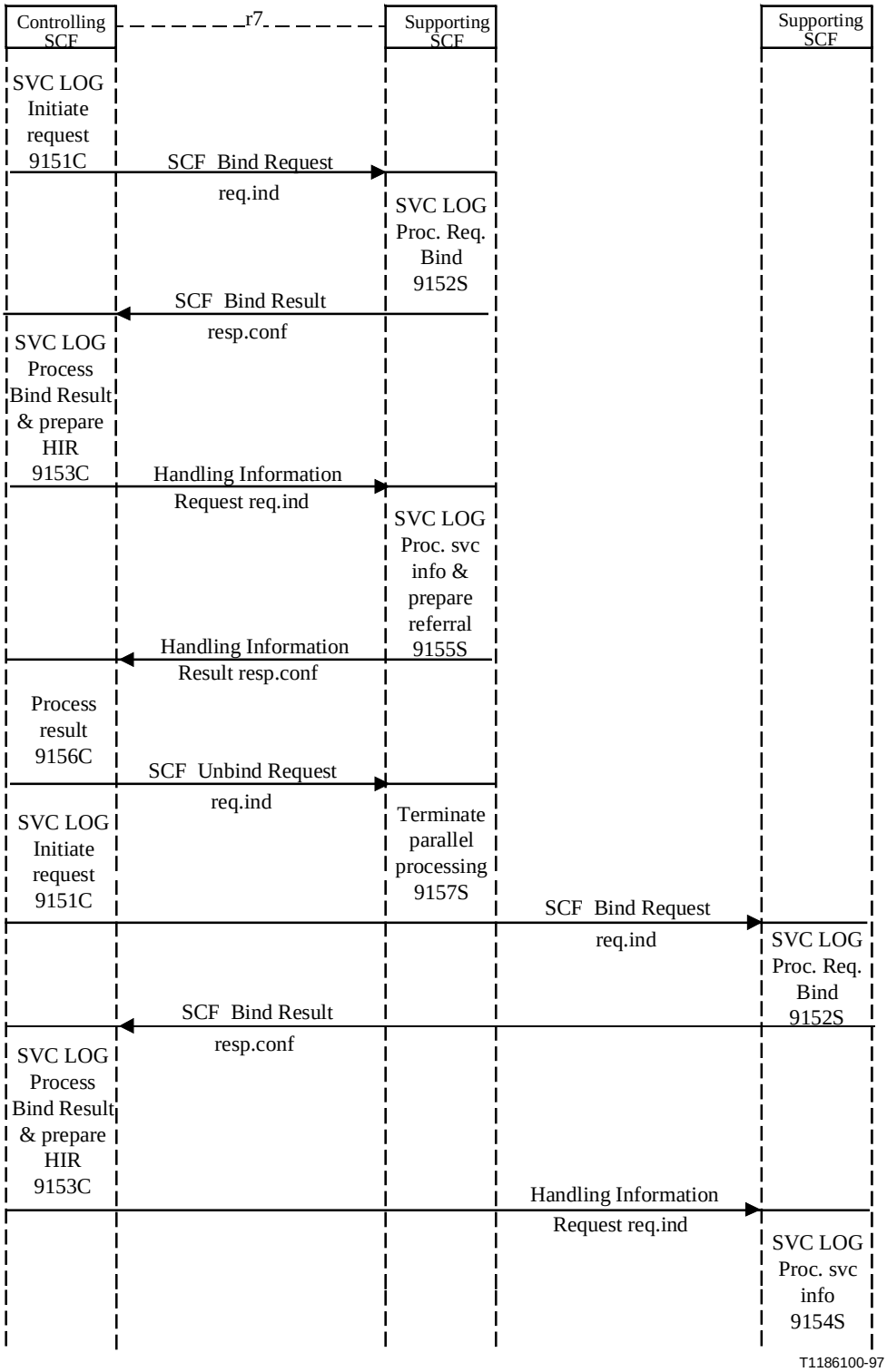


Figure 11-32/Q.1224 – Information flow diagram INITIATE SERVICE PROCESS SIB, with information flow referral

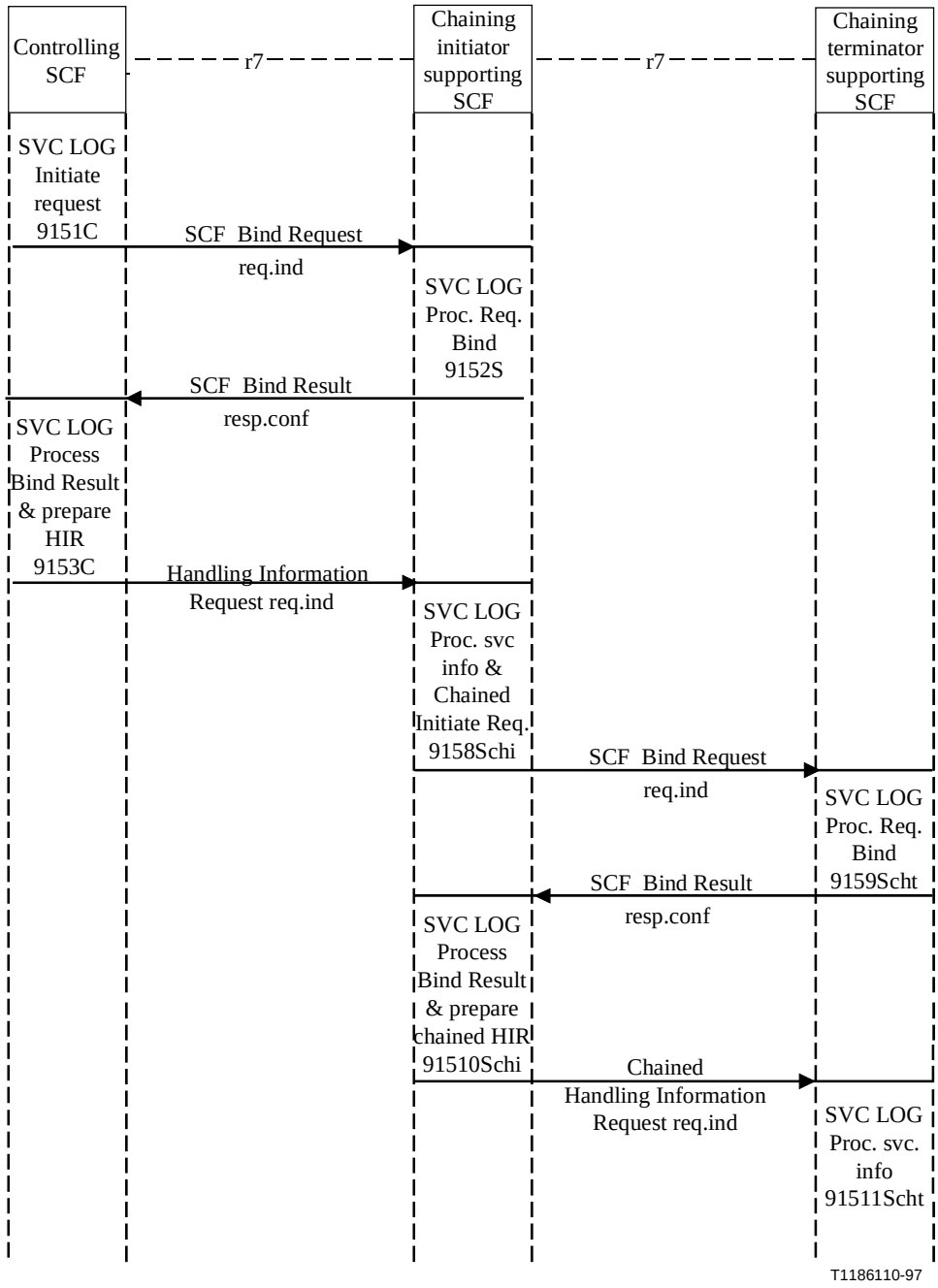


Figure 11-33/Q.1224 – Information flow diagram INITIATE SERVICE PROCESS SIB, with information flow chaining

11.2.7.3 SDLs

Figure 11-34 is a SDL diagram, that shows the actions at the controlling and supporting SCFs involved in executing the INITIATE SERVICE PROCESS SIB, including chaining.

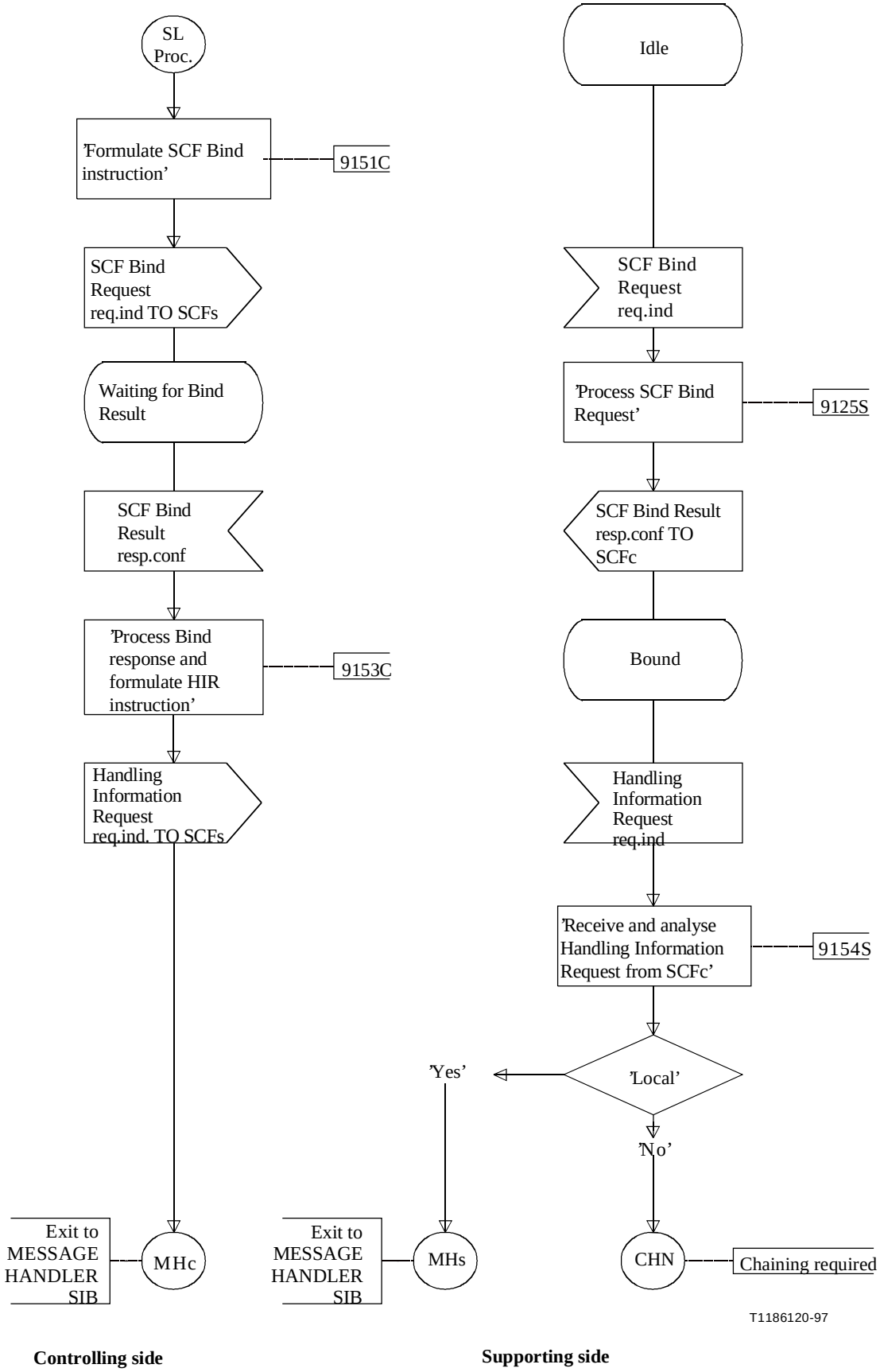


Figure 11-34/Q.1224 (sheet 1 of 2) – SCF actions for INITIATE SERVICE PROCESS SIB

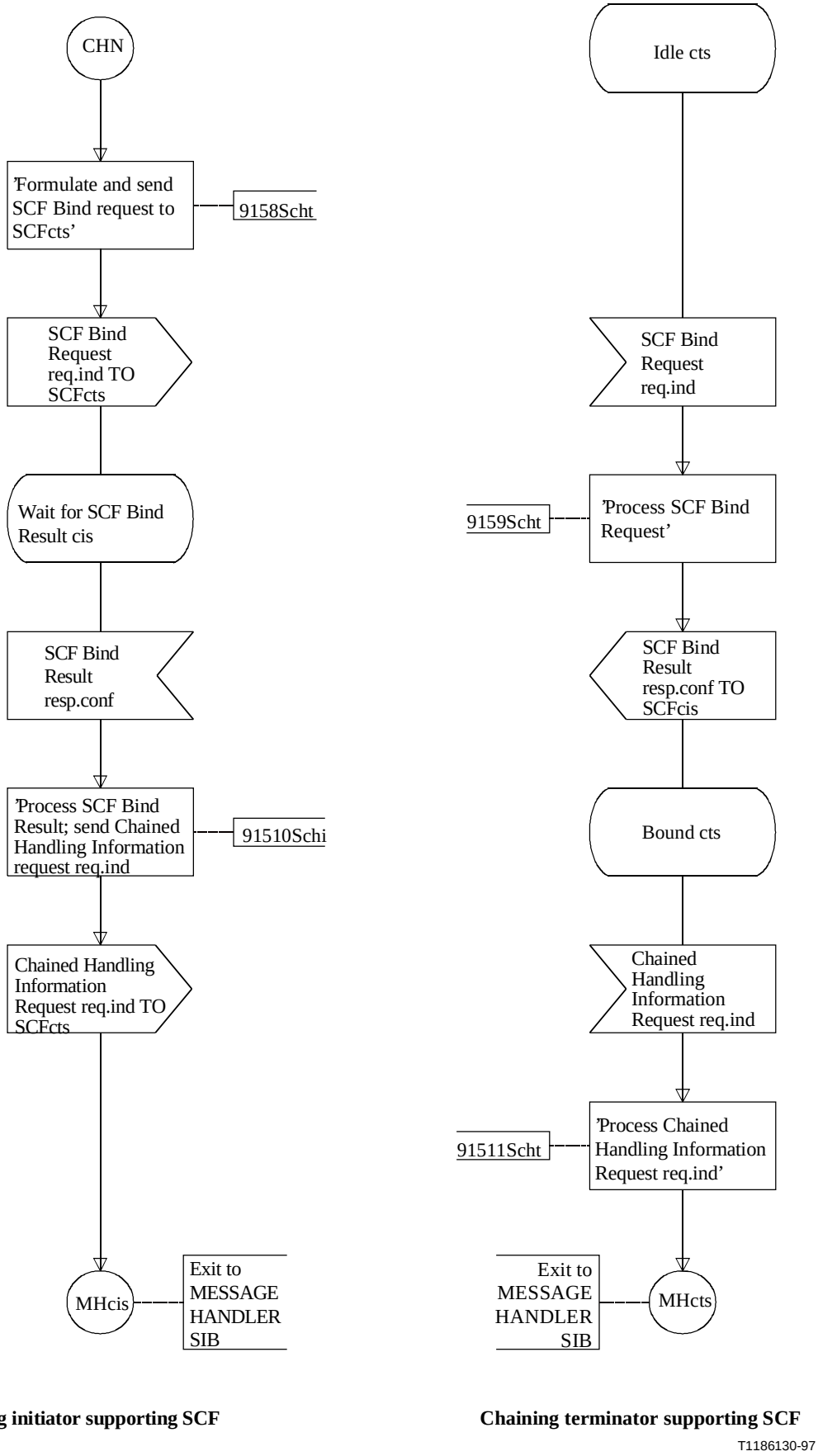


Figure 11-34/Q.1224 (sheet 2 of 2) – SCF actions for INITIATE SERVICE PROCESS SIB

11.2.7.4 Functional Entity Actions

The character "C" is appended to functional entity action numbers for the controlling SCF and the character "S" is appended to functional entity action numbers for the supporting SCF. The characters "Schi" are appended to the functional entity action numbers for the chaining initiator supporting SCF and the characters "Scht" are appended to the functional entity action numbers for the chaining terminator supporting SCF.

Controlling SCF-related FEAs

Reference Number	*Action*
9151C	Process request from service logic – Generate and send a SCF Bind Request to a supporting SCF
9153C	Receive the SCF Bind Result from the supporting SCF – Verify the SCF Bind Result from the supporting SCF – Generate and send the Handling Information Request to the supporting SCF
9156C	Receive and analyse the information flow referral from the supporting SCF – Generate and send the SCF Bind Request to the new supporting SCF

Supporting SCF-related FEAs

Reference Number	*Action*
9152S	Receive and analyse the SCF Bind Request from the controlling SCF – Verify the SCF Bind Request from the controlling SCF – Generate and send the SCF Bind Result to the controlling SCF
9154S	Receive and analyse the Handling Information Request from the controlling SCF – Process the Handling Information Request
9155S	Receive and analyse the Handling Information Request from the controlling SCF – Process the Handling Information Request – Generate and send the information flow referral to the controlling SCF
9157S	Process SCF Unbind request from controlling SCF and terminate processing
9158Schi	Formulate and send the SCF Bind Request to the chaining terminator supporting SCF
9159Scht	Receive, analyse and verify the SCF Bind Request from the chaining initiator supporting SCF – Formulate and send the SCF Bind Result to the chaining initiator supporting SCF

91510Schi Receive and analyse the SCF Bind Result from the chaining terminator supporting SCF

– Formulate and send the Chained Handling Information Request to the chaining terminator supporting SCF

91511Scht Receive and analyse the Chained Handling Information Request from the chaining initiator supporting SCF

– Process the Chained Handling Information Request

11.2.8 JOIN SIB

11.2.8.1 Description

The JOIN SIB provides the capability to move a leg into a call segment or to move a call segment into another call segment or call segment association. The SIB is used to move a call party into a call segment to (re)-establish a connection towards the Connection Point (CP). All the associated events will be known in the context of the call segment that contains the joined call party.

The SIB can be also used to move a call segment, containing one or more call parties, into a call segment association. The SIB can also be used to merge a call segment into another call segment.

11.2.8.2 Information flow diagrams

Figure 11-35 depicts the information flows and functional entity actions to support the join functionality for the move legs mode, Figure 11-36 for move call segments mode, and Figure 11-37 for merge call segments mode.

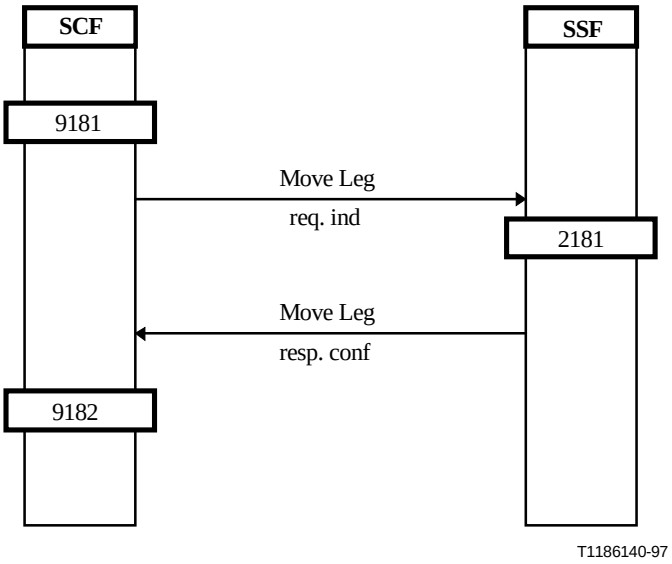


Figure 11-35/Q.1224 – Information Flow Diagram JOIN SIB, mode Move Legs

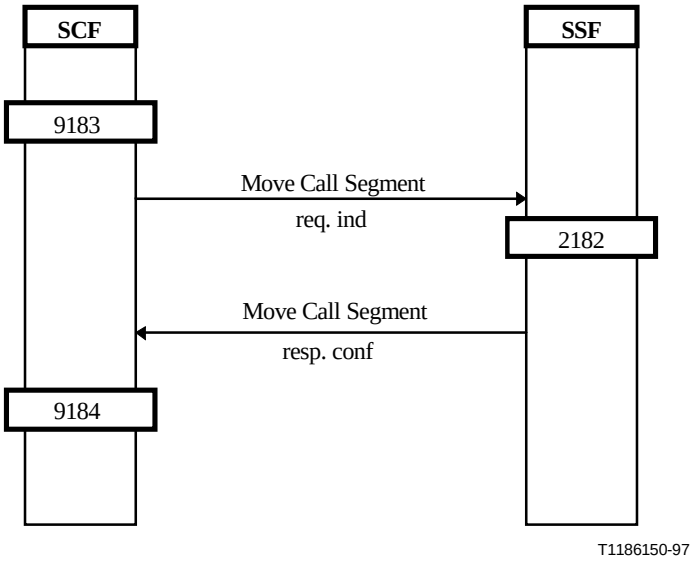


Figure 11-36/Q.1224 – Information Flow Diagram JOIN SIB, mode Move Call Segments

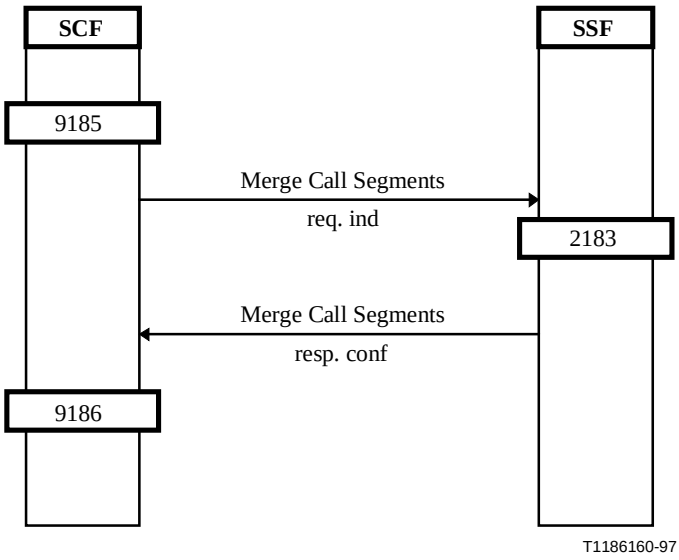


Figure 11-37/Q.1224 – Information Flow Diagram JOIN SIB, mode Merge Call Segments

11.2.8.3 SDLs

Figure 11-38 presents the SDL diagram for the SCF processing of the JOIN SIB (move leg).

Figure 11-39 presents the SDL diagram for the SSF processing of the JOIN SIB (move leg).

Figure 11-40 presents the SDL diagram for the SCF processing of the JOIN SIB (move call segments).

Figure 11-41 presents the SDL diagram for the SSF processing of the JOIN SIB (move call segment).

Figure 11-42 presents the SDL diagram for the SCF processing of the JOIN SIB (merge call segments).

Figure 11-43 presents the SDL diagram for the SSF processing of the JOIN SIB (merge call segment).

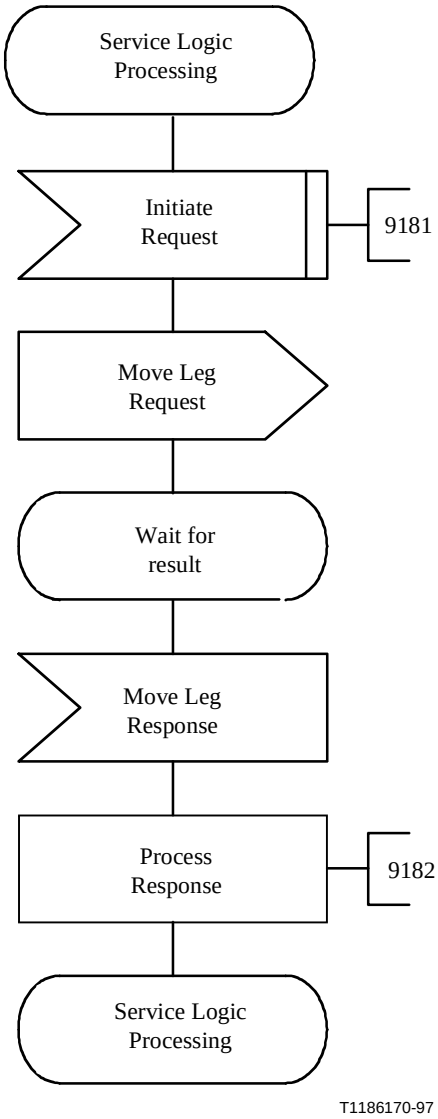


Figure 11-38/Q.1224 – SCF actions for JOIN SIB (move legs)

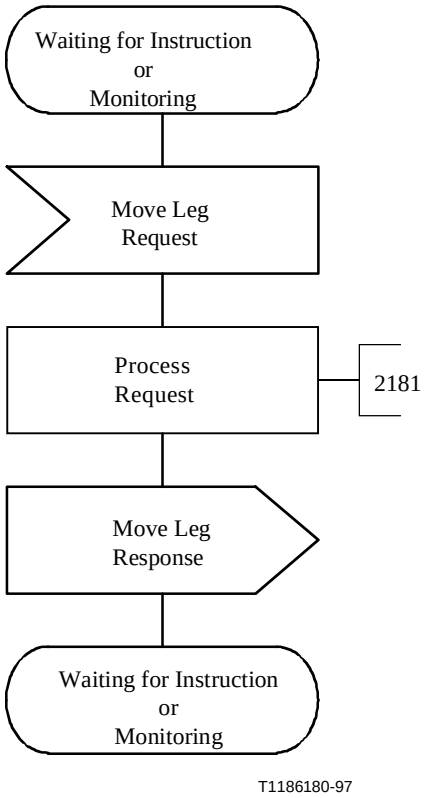


Figure 11-39/Q.1224 – SSF actions for JOIN SIB (move legs)

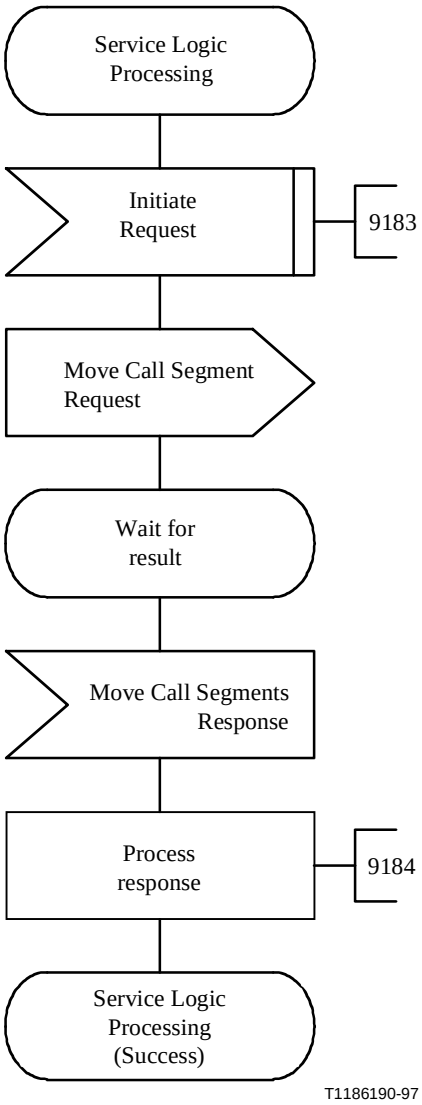


Figure 11-40/Q.1224 – SCF actions for JOIN SIB (move call segments)

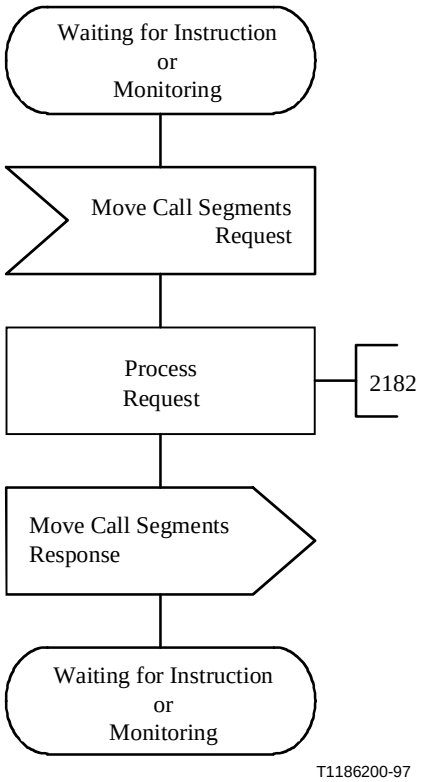


Figure 11-41/Q.1224 – SSF actions for JOIN SIB (move call segments)

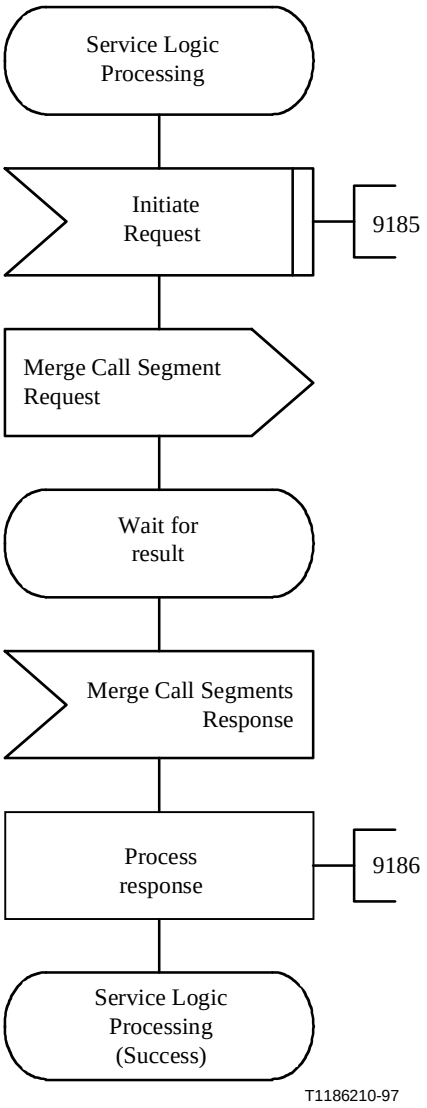


Figure 11-42/Q.1224 – SCF actions for JOIN SIB (merge call segments)

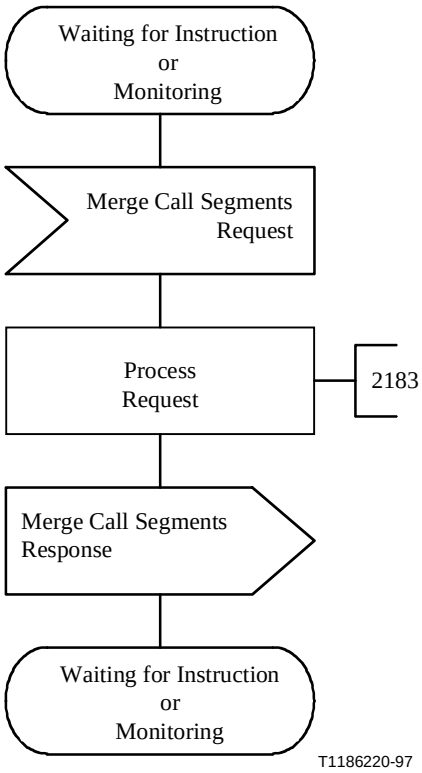


Figure 11-43/Q.1224 – SSF actions for JOIN SIB (merge call segments)

11.2.8.4 Functional entity actions

SCF-related FEAs

Reference Number	*Action*
9181	Initiate request
	– Initiate a Move Leg req.ind
9182	Process Move Leg resp. conf.
	– Receive and analyze Move Leg resp. conf.
	– Return response to service logic
9183	Initiate request
	– Initiate a Move Call Segment req.ind

9184	Process Move Call Segment resp. conf.
	– Receive and analyze Move Call Segment resp. conf.
	– Return response to service logic
9185	Initiate request
	– Initiate a Merge Call Segment req.ind
9186	Process Merge Call Segment resp. conf.
	– Receive and analyze Merge Call Segment resp. conf.
	– Return response to service logic

SSF-related FEAs

Reference Number	*Action*
2181	Process Move Leg req. ind.
	– Receive and analyze Move Leg req. ind.
	– Apply call party handling procedures
	– Return Move Leg resp. conf.
2182	Process Move Call Segment req. ind.
	– Receive and analyze Move Call Segment req. ind.
	– Apply call party handling procedures
	– Return Move Call Segment resp. conf.
2183	Process Merge Call Segment req. ind.
	– Receive and analyze Merge Call Segment req. ind.
	– Apply call party handling procedures
	– Return Merge Call Segment resp. conf.

11.2.9 LOG CALL INFORMATION SIB

11.2.9.1 Description

The LOG CALL INFORMATION SIB records detailed information for each call. The network logs (or writes) specified information about the call to a specified storage space. Calls that do not request the assistance of IN functions ("non IN-provided calls") are not affected by this SIB. The use of chaining and referral in LOG CALL INFORMATION SIB is identical with the use in SERVICE DATA MANAGEMENT SIB. Data distribution requiring chaining and referral mechanism for data access is a matter only for the DFP and not for the GFP.

11.2.9.2 Information flow diagrams

Figure 11-44 depicts the information flows and functional entity actions to support log call information functionality.

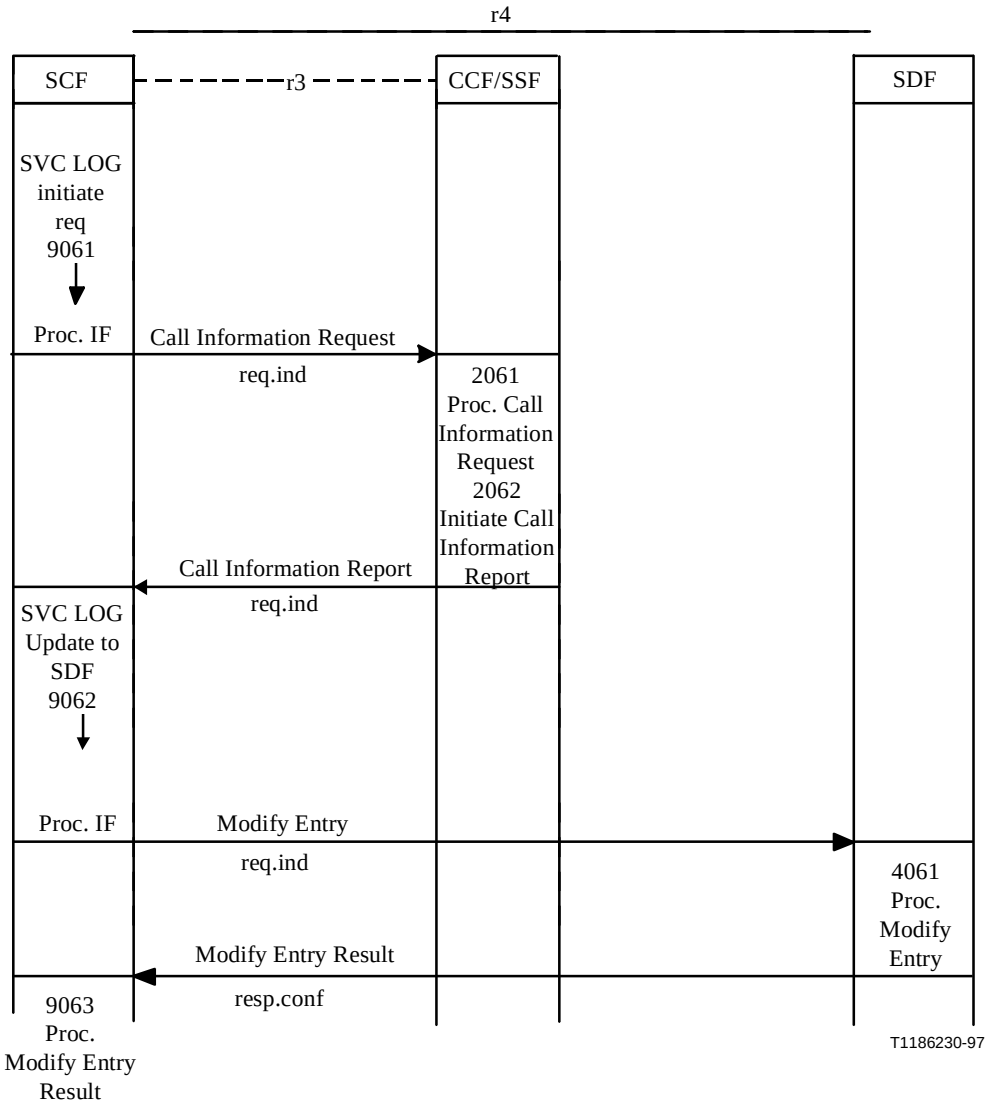


Figure 11-44/Q.1224 – Information flow diagram LOG CALL INFORMATION SIB

11.2.9.3 SDLs

Figure 11-45 presents the SDL diagram for the SCF processing of the LOG CALL INFORMATION SIB functionality.

Figure 11-46 presents the SDL diagram for the CCF/SSF processing of the LOG CALL INFORMATION SIB functionality.

Figure 11-47 presents the SDL diagram for the SDF processing of the LOG CALL INFORMATION SIB functionality.

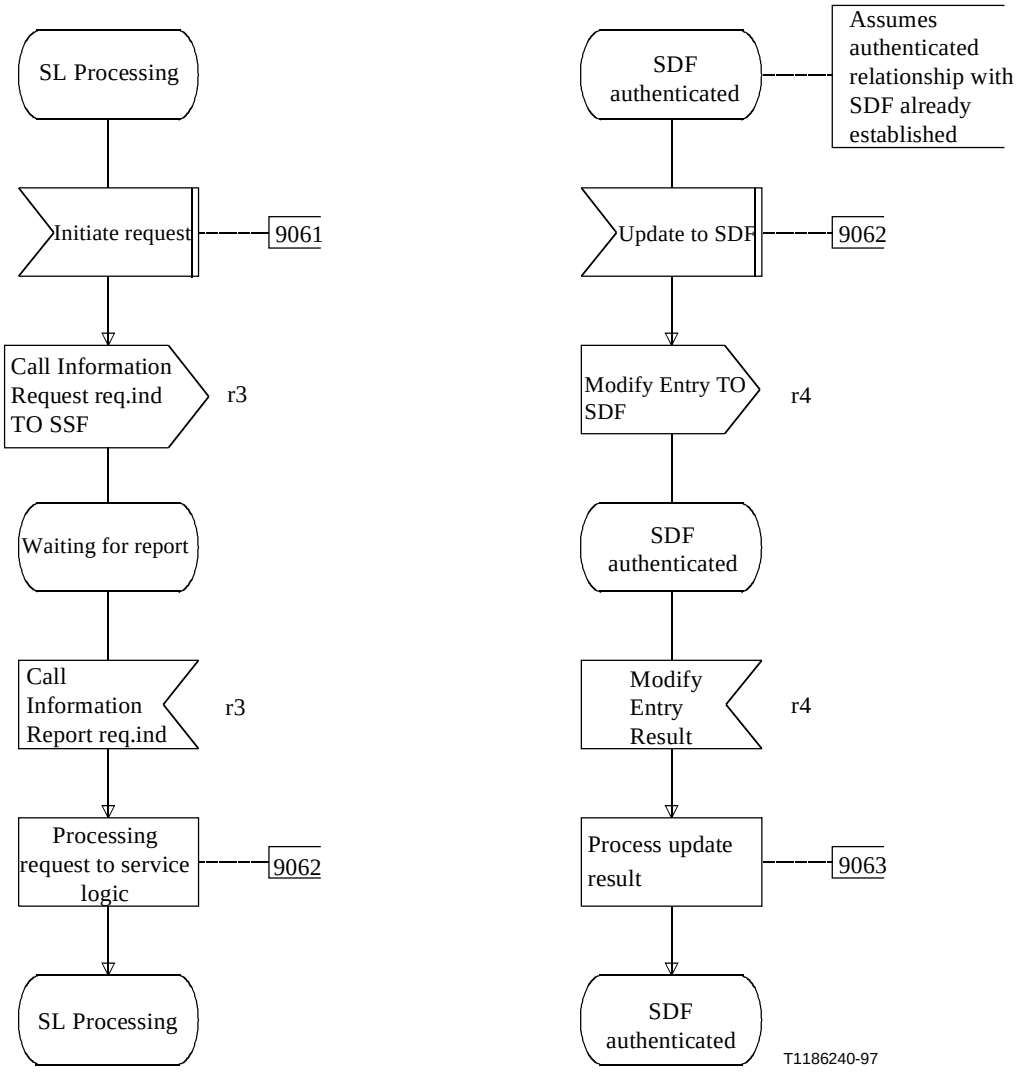


Figure 11-45/Q.1224 – SCF actions for the LOG CALL INFORMATION SIB

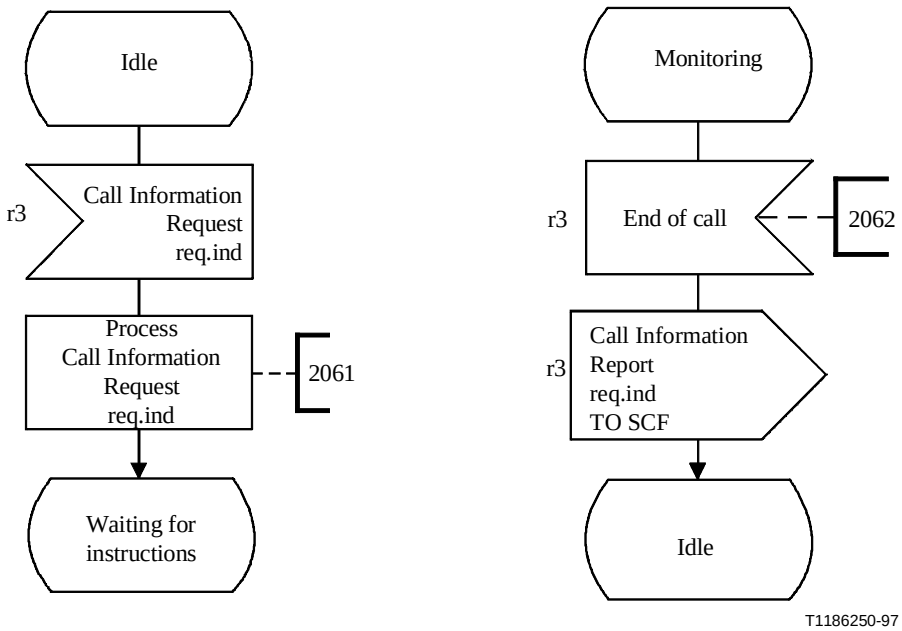


Figure 11-46/Q.1224 – CCF/SSF actions for the LOG CALL INFORMATION SIB

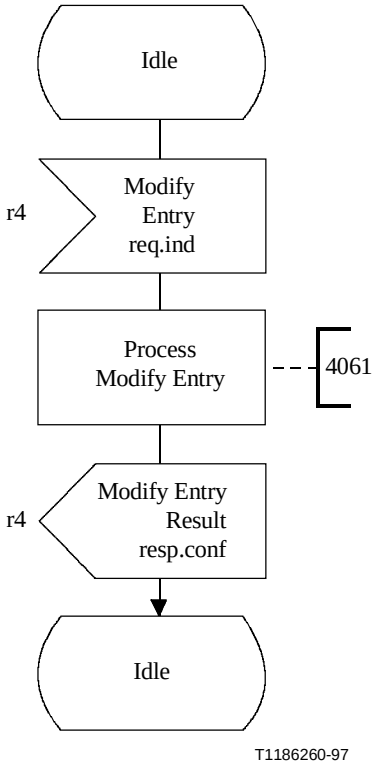


Figure 11-47/Q.1224 – SDF actions for the LOG CALL INFORMATION SIB

11.2.9.4 Functional entity actions

SCF-related FEAs

Reference number	*Action*
9061	Initiate request
	– Initiate Call Information Request req.ind
9062	Process report and initiate update
	– Process Call Information Report req.ind
	– Initiate Modify Entry
9063	Process update result
	– Process Modify Entry Result

SSF-related FEAs

Reference number	*Action*
2061	Process Call Information Request req.ind
	– Receive and analyse Call Information Request req.ind
	– Apply specified call information request procedures
	– Save specified call information; then
	– Wait for the end of the call
2062	Detect end of the call
	– Initiate a Call Information Report req.ind

SDF-related FEA

Reference number	*Action*
4061	Process Modify Entry – Receive and analyse Modify Entry – Apply specified update data procedures – Return Modify Entry Result

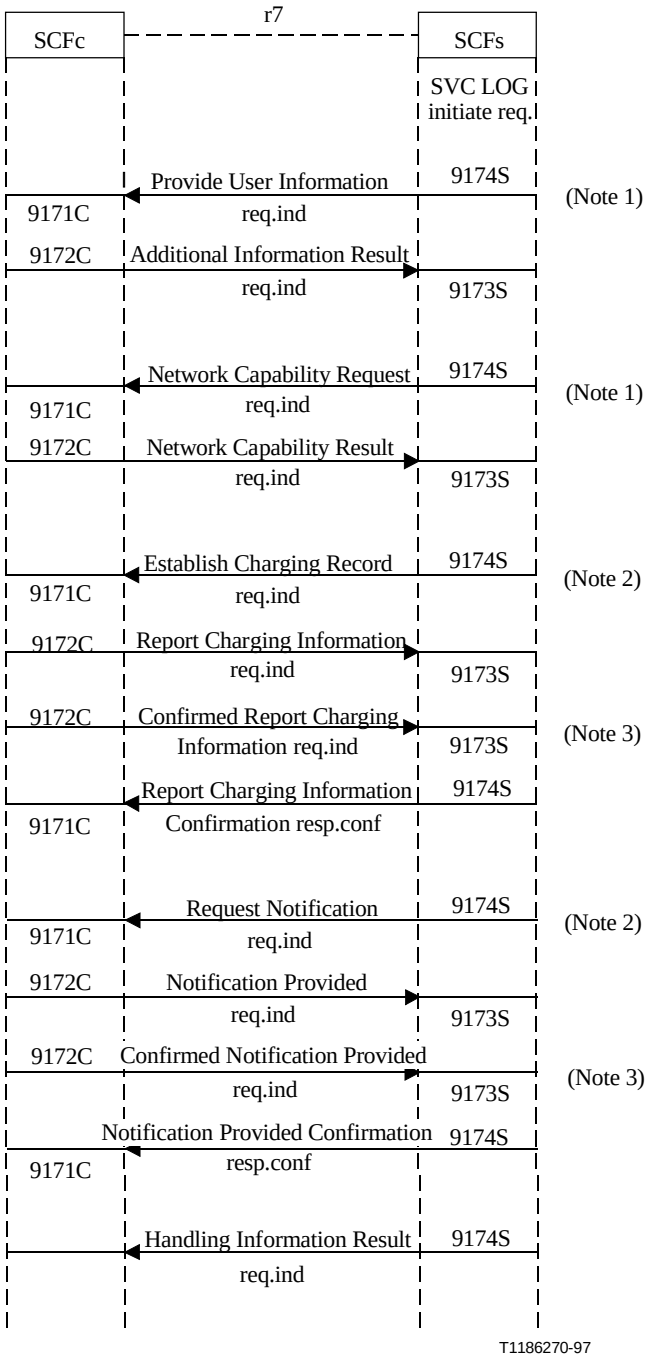
11.2.10 MESSAGE HANDLER SIB

11.2.10.1 Description

MESSAGE HANDLER SIB is a SIB which describes the exchange of information flows between a controlling SCF and a supporting SCF for the provision of information to the controlling SCF. The MESSAGE HANDLER SIB must be preceded by INITIATE SERVICE PROCESS SIB and followed by END SIB.

11.2.10.2 Information flow diagrams

Figure 11-48 depicts the information flows and functional entity actions to support MESSAGE HANDLER SIB functionality without chaining, and Figure 11-49 includes chaining. For clarity, the information flows to and from the controlling SCF are included in the chaining information flows.

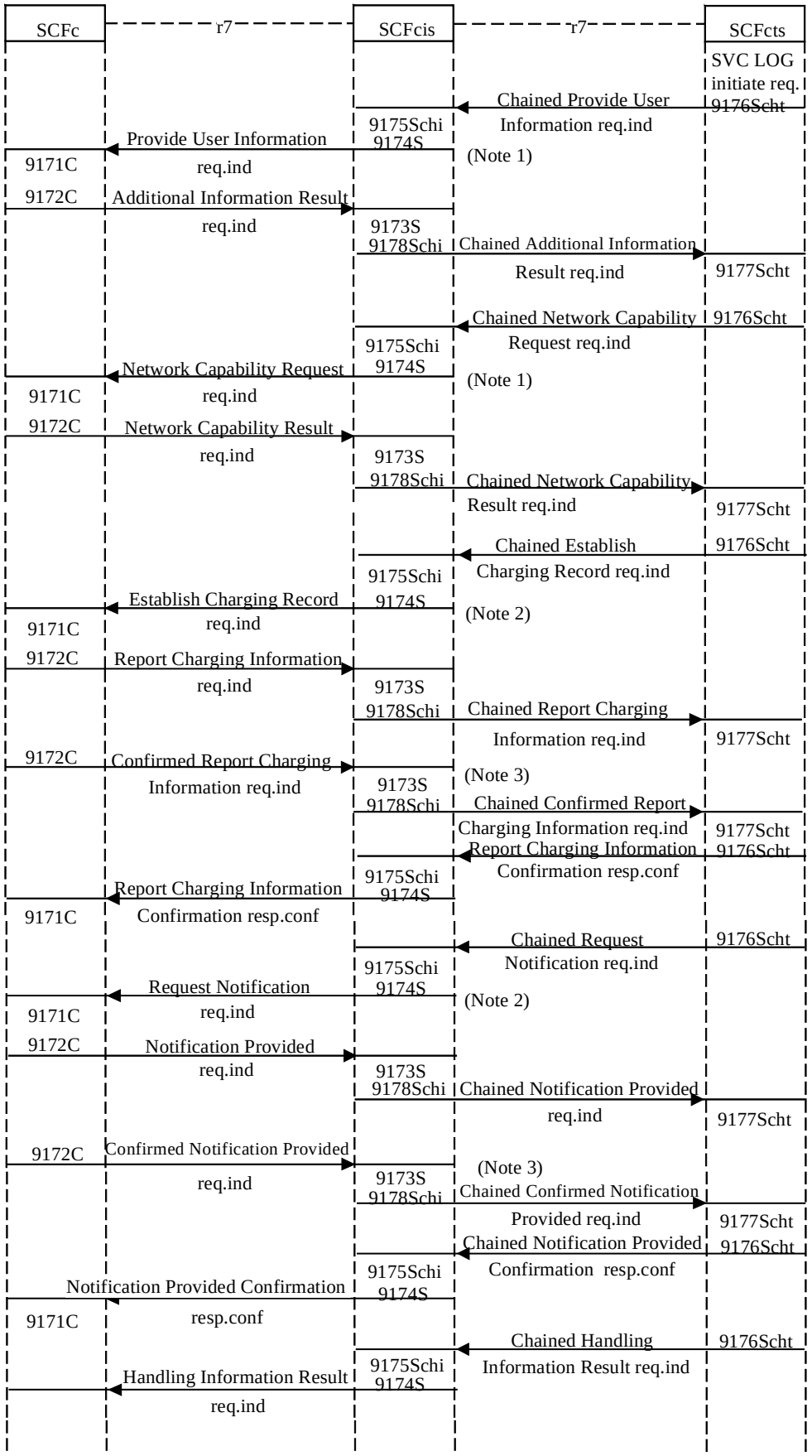


NOTE 1 – Optional; if sent, the only allowed response from SCFc is Additional Information. Result and no other information flows can be sent from SCFs to SCFc before the response is received.

NOTE 2 – Optional; not required if sending of responding information flow from SCFc to SCFs is pre-arranged. If information flow sent from SCFs to SCFc, other information flows from SCFs to SCFc can be sent before the response is received.

NOTE 3 – Optional request for confirmation to be sent from SCFs to SCFc following receipt of information flow by SCFs.

Figure 11-48/Q.1224 – Information flow diagram MESSAGE HANDLER SIB



NOTES 1, 2 and 3 – The same as Figure 11-48.

Figure 11-49/Q.1224 – Information flow diagram MESSAGE HANDLER SIB, with chaining

11.2.10.3 SDLs

Figure 11-50 presents the SDL diagram for the controlling and supporting SCF processing of the MESSAGE HANDLER SIB without chaining and Figure 11-51 shows the chaining case. For clarity, the information flows to and from the controlling SCF are included in the chaining SDLs.

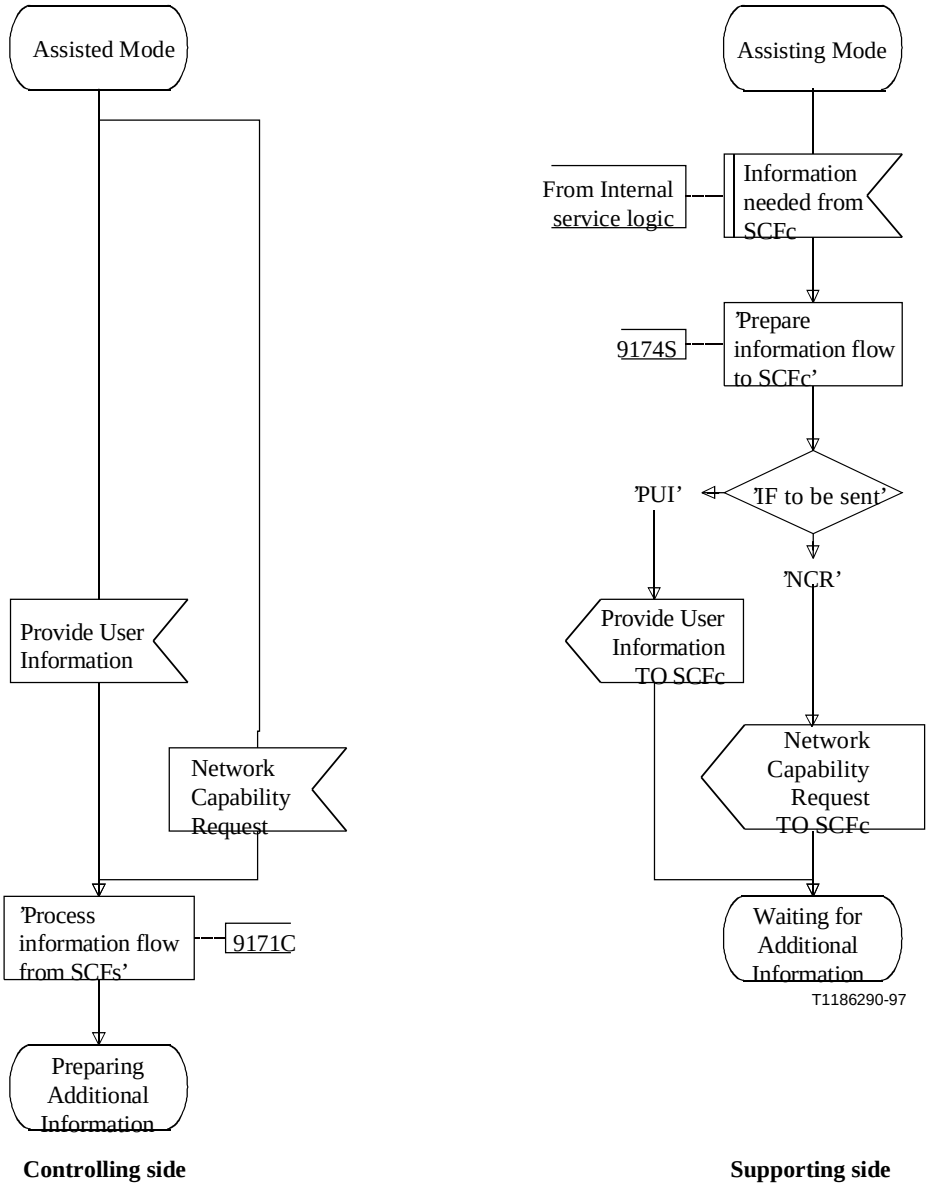


Figure 11-50/Q.1224 (sheet 1 of 8) – Controlling and supporting SCF actions for the MESSAGE HANDLER SIB

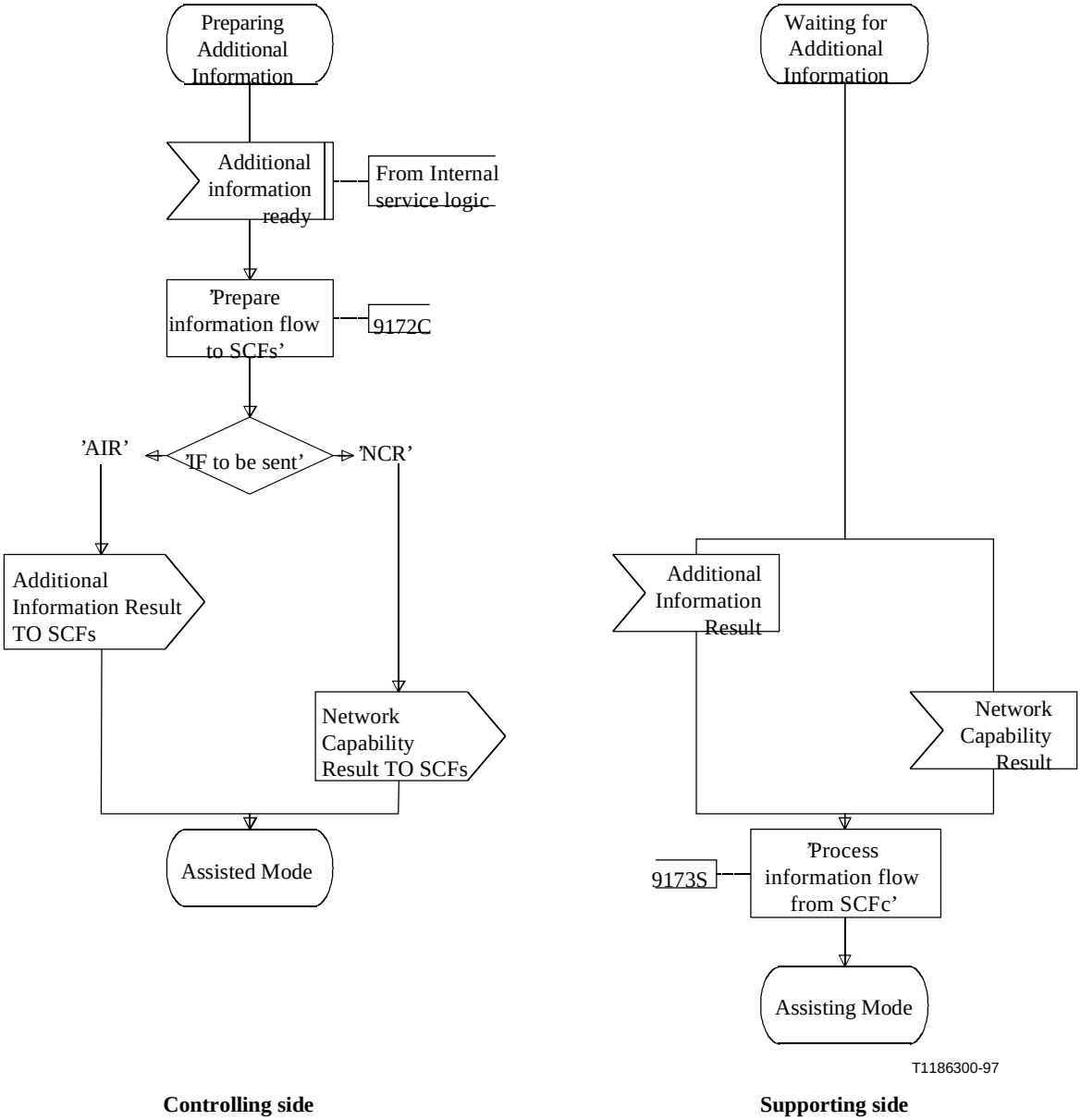


Figure 11-50/Q.1224 (sheet 2 of 8) – Controlling and supporting SCF actions for the MESSAGE HANDLER SIB

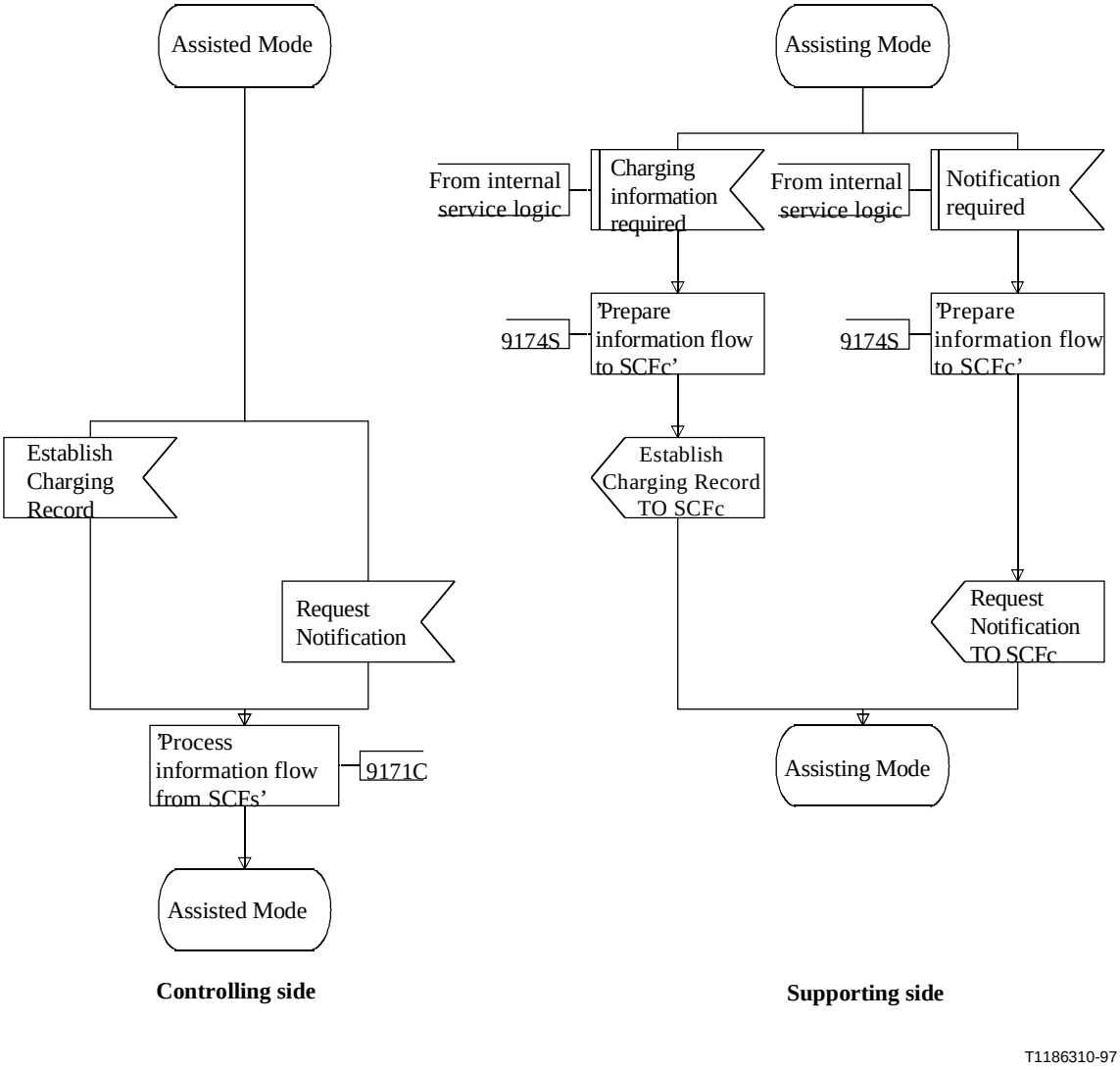


Figure 11-50/Q.1224 (sheet 3 of 8) – Controlling and supporting SCF actions for the MESSAGE HANDLER SIB

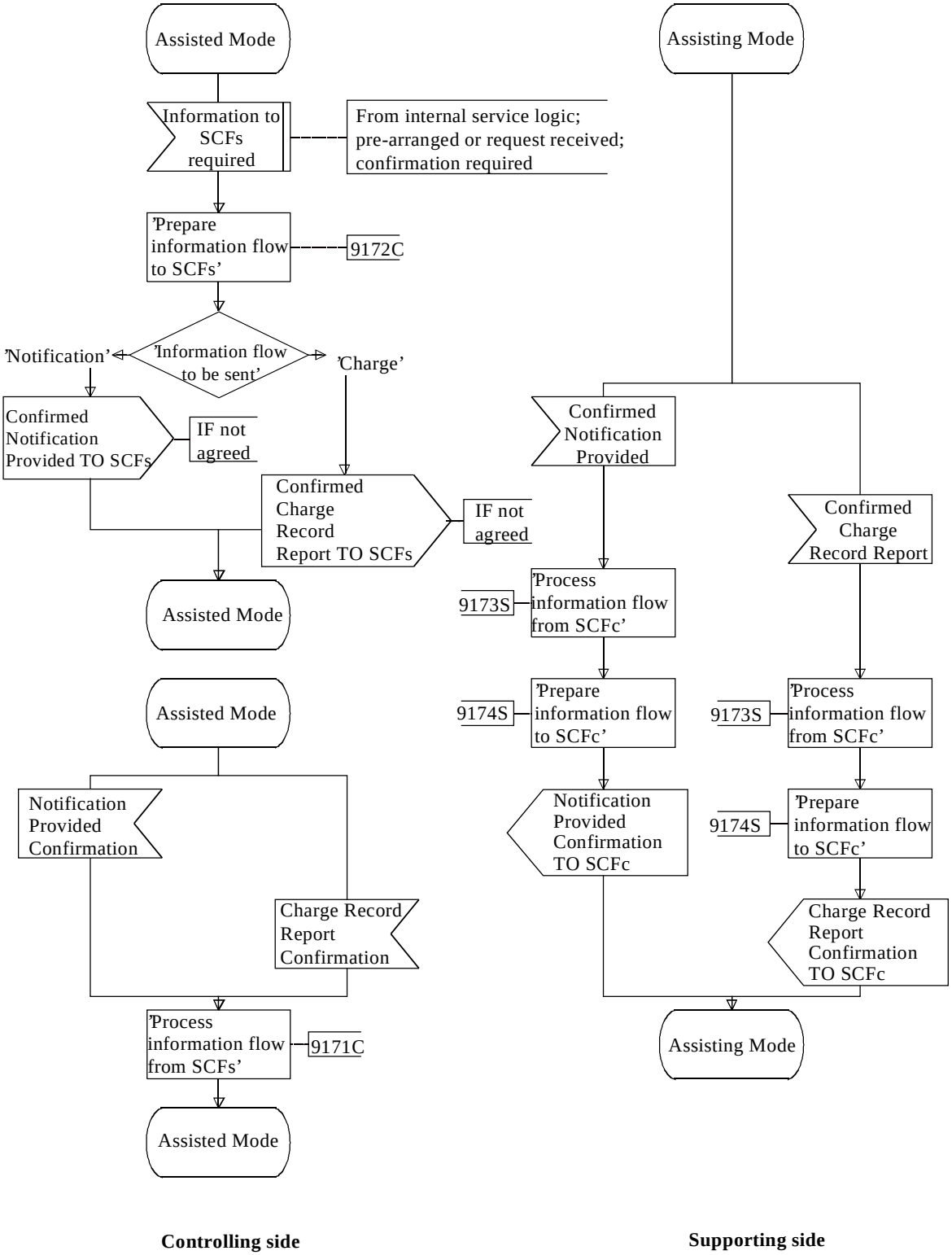


Figure 11-50/Q.1224 (sheet 4 of 8) – Controlling and supporting SCF actions for the MESSAGE HANDLER SIB

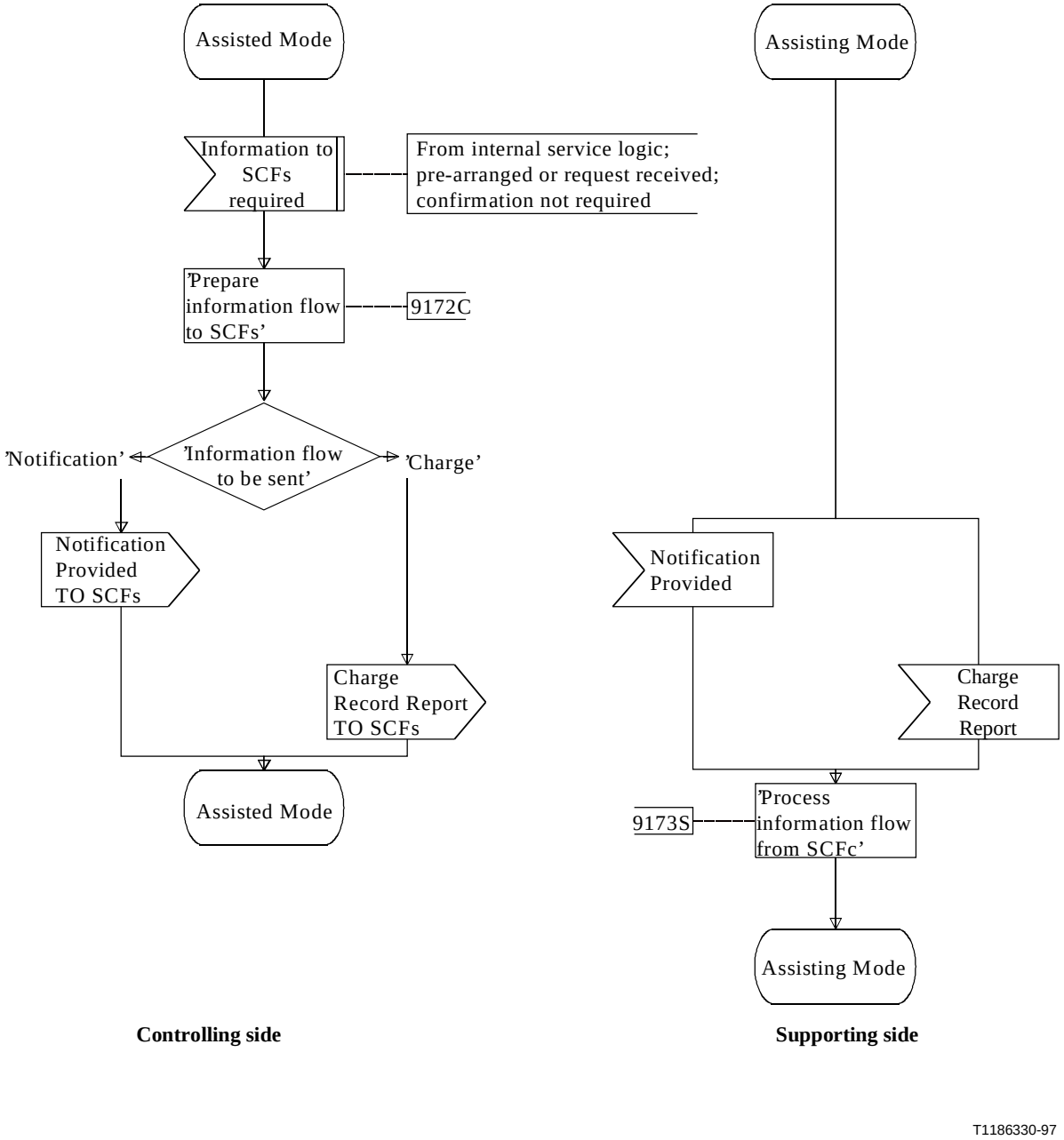


Figure 11-50/Q.1224 (sheet 5 of 8) – Controlling and supporting SCF actions for the MESSAGE HANDLER SIB

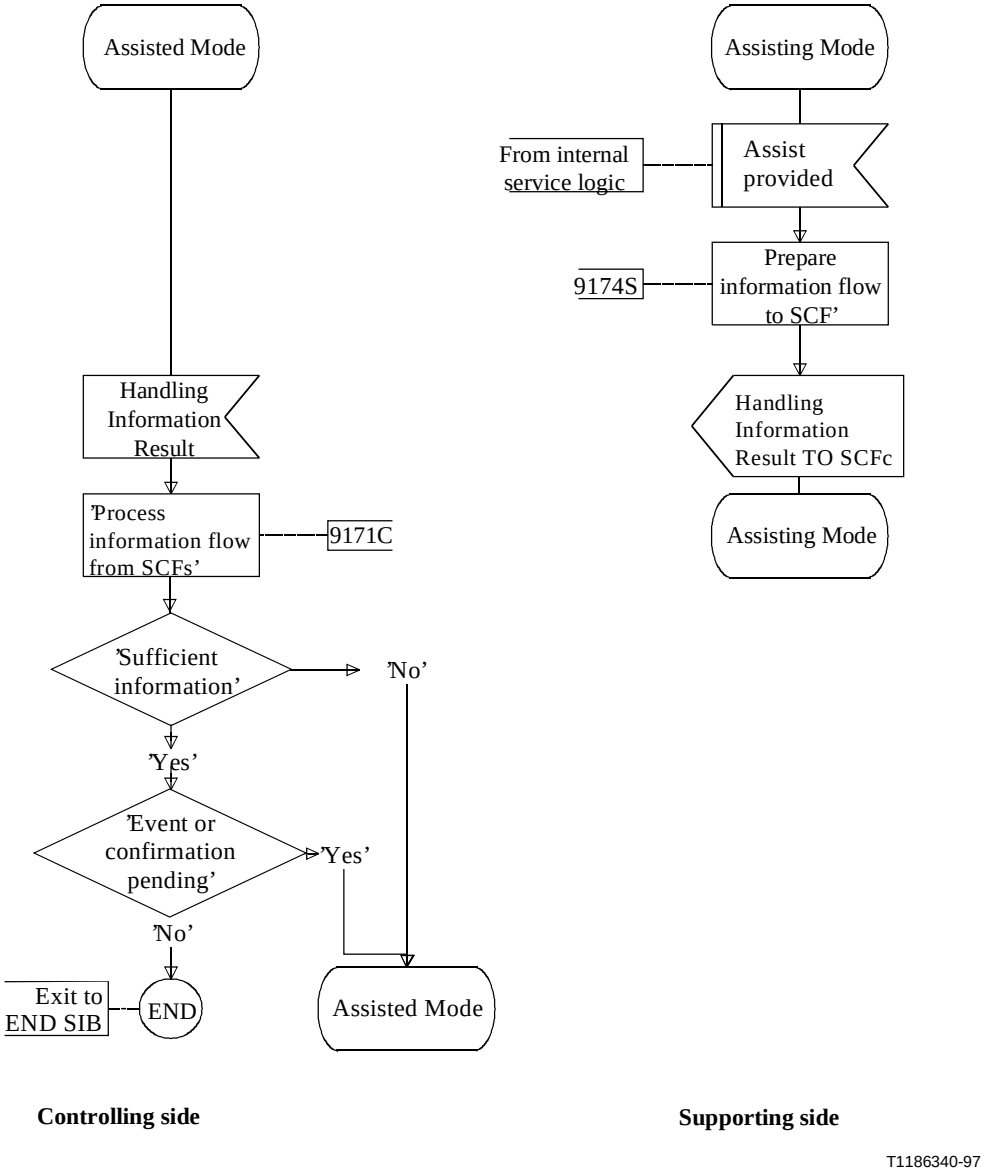


Figure 11-50/Q.1224 (sheet 6 of 8) – Controlling and supporting SCF actions for the MESSAGE HANDLER SIB

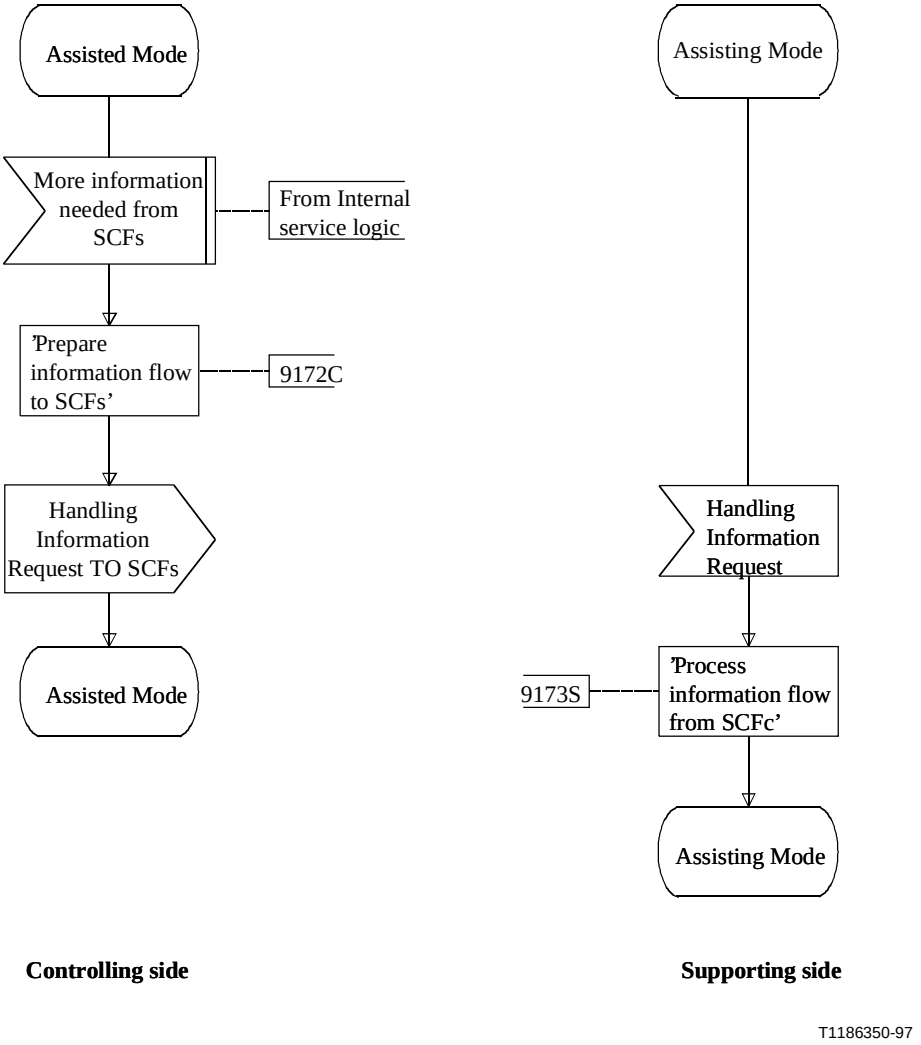
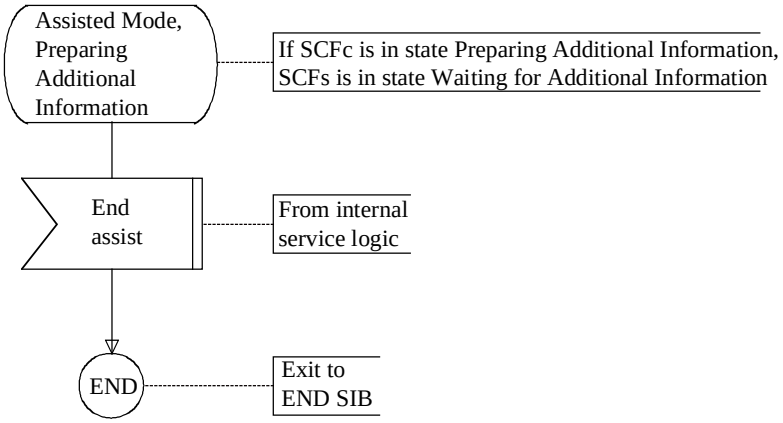


Figure 11-50/Q.1224 (sheet 7 of 8) – Controlling and supporting SCF actions for the MESSAGE HANDLER SIB



Controlling side

NOTE – Actions for supporting SCF are part of END SIB.

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Figure 11-50/Q.1224 (sheet 8 of 8) – Controlling SCF actions for the MESSAGE HANDLER SIB

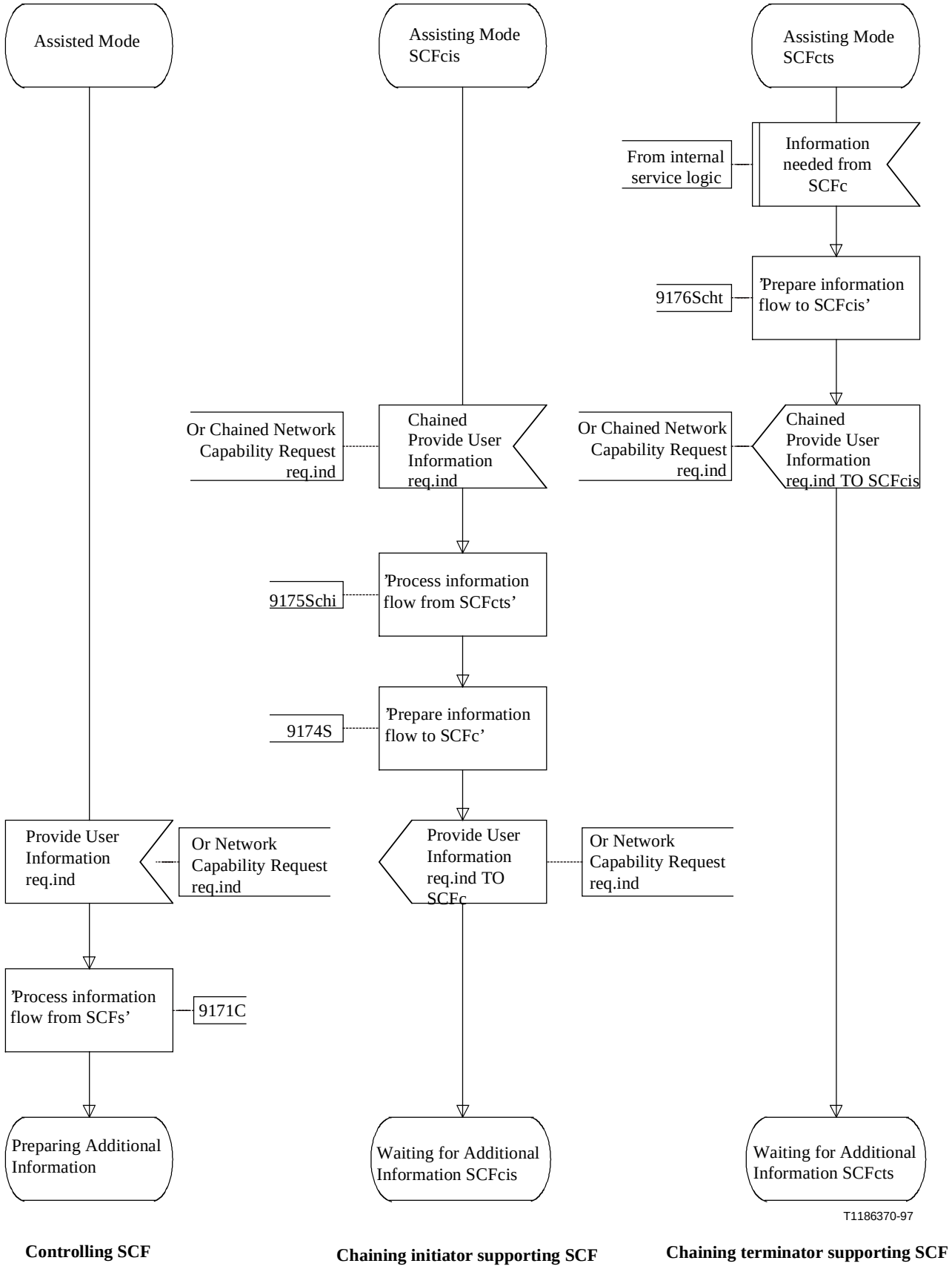


Figure 11-51/Q.1224 (sheet 1 of 4) – Controlling and supporting SCF actions for the MESSAGE HANDLER SIB, including chaining

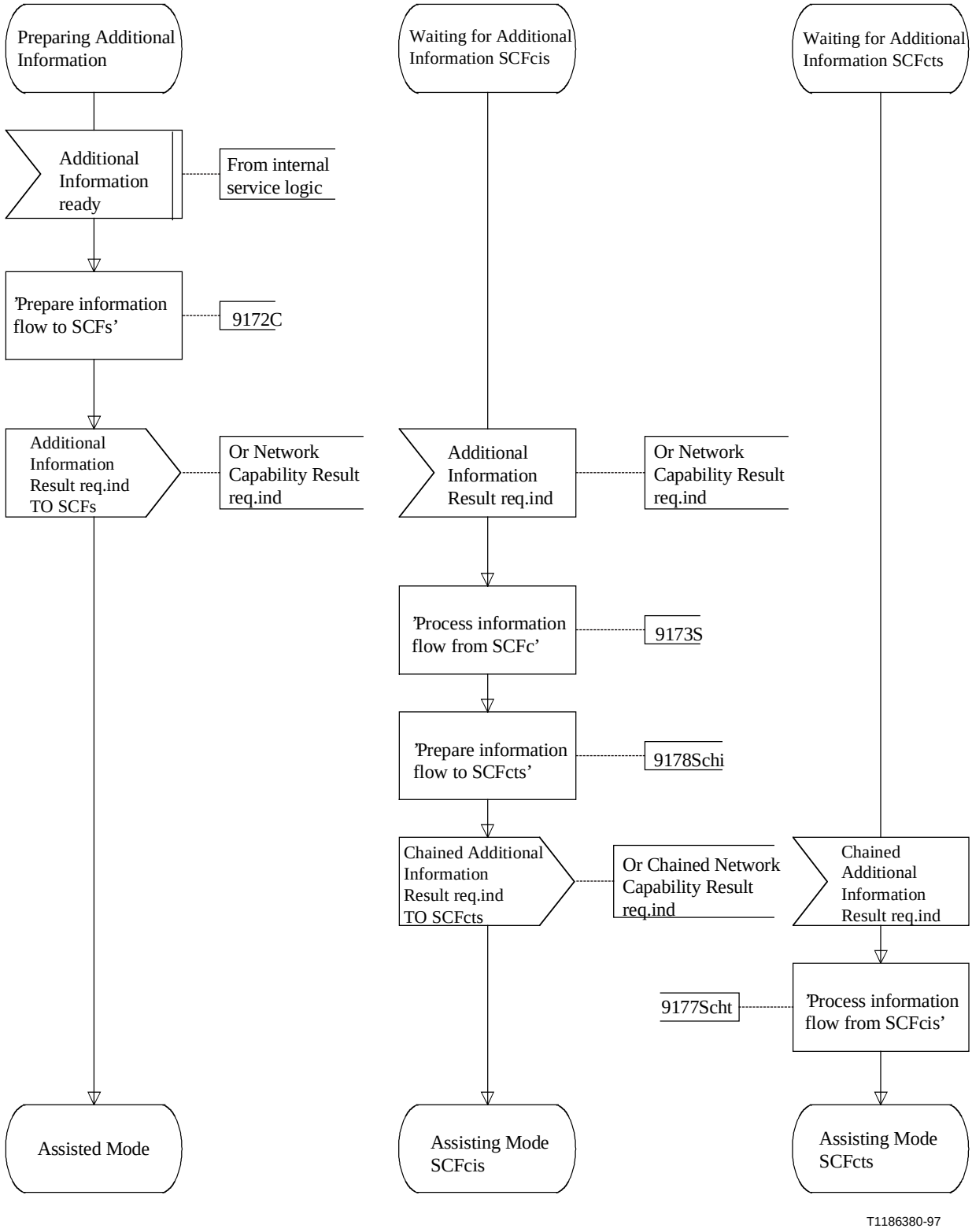


Figure 11-51/Q.1224 (sheet 2 of 4) – Controlling and supporting SCF actions for the MESSAGE HANDLER SIB, including chaining

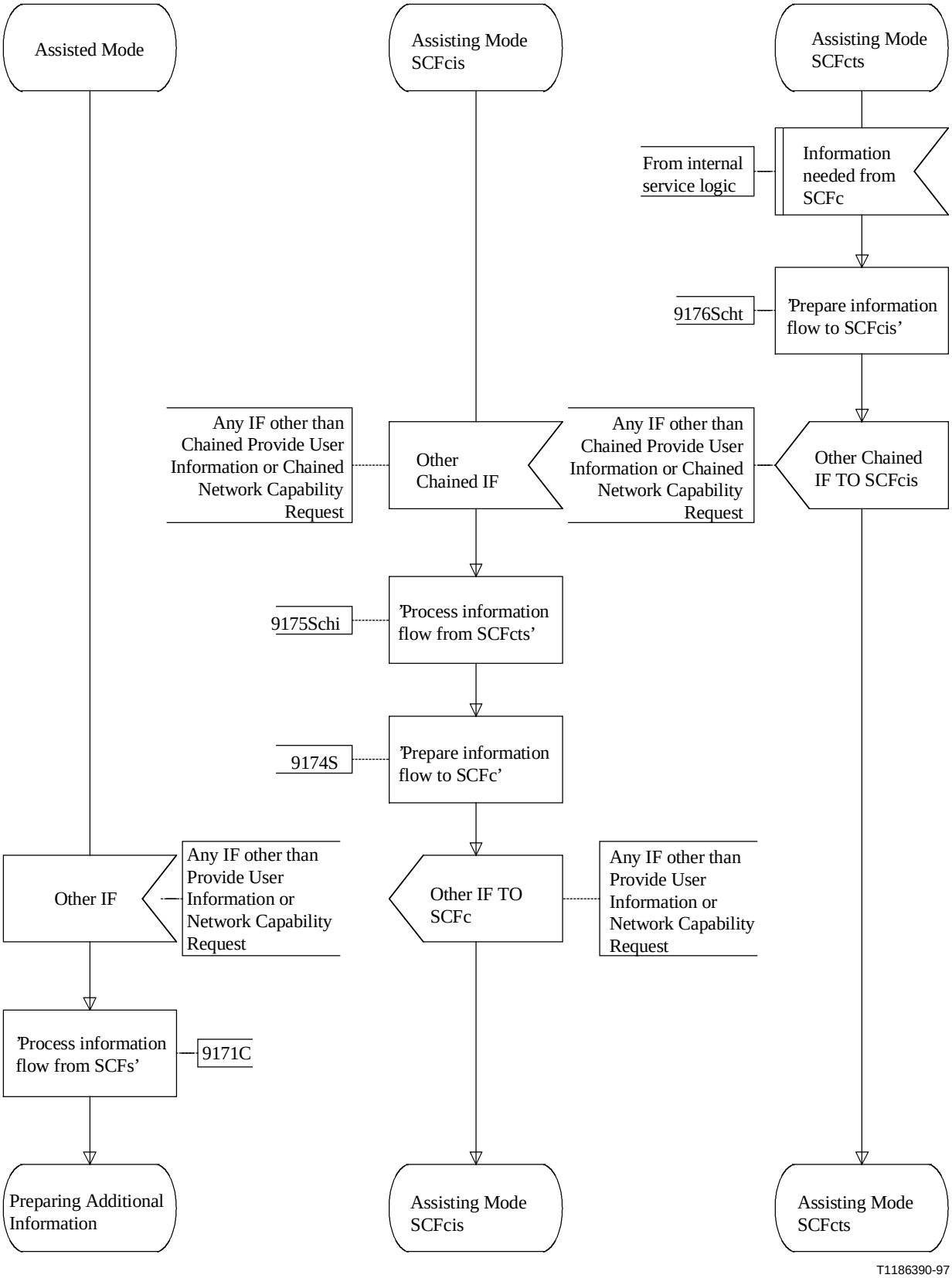


Figure 11-51/Q.1224 (sheet 3 of 4) – Controlling and supporting SCF actions for the MESSAGE HANDLER SIB, including chaining

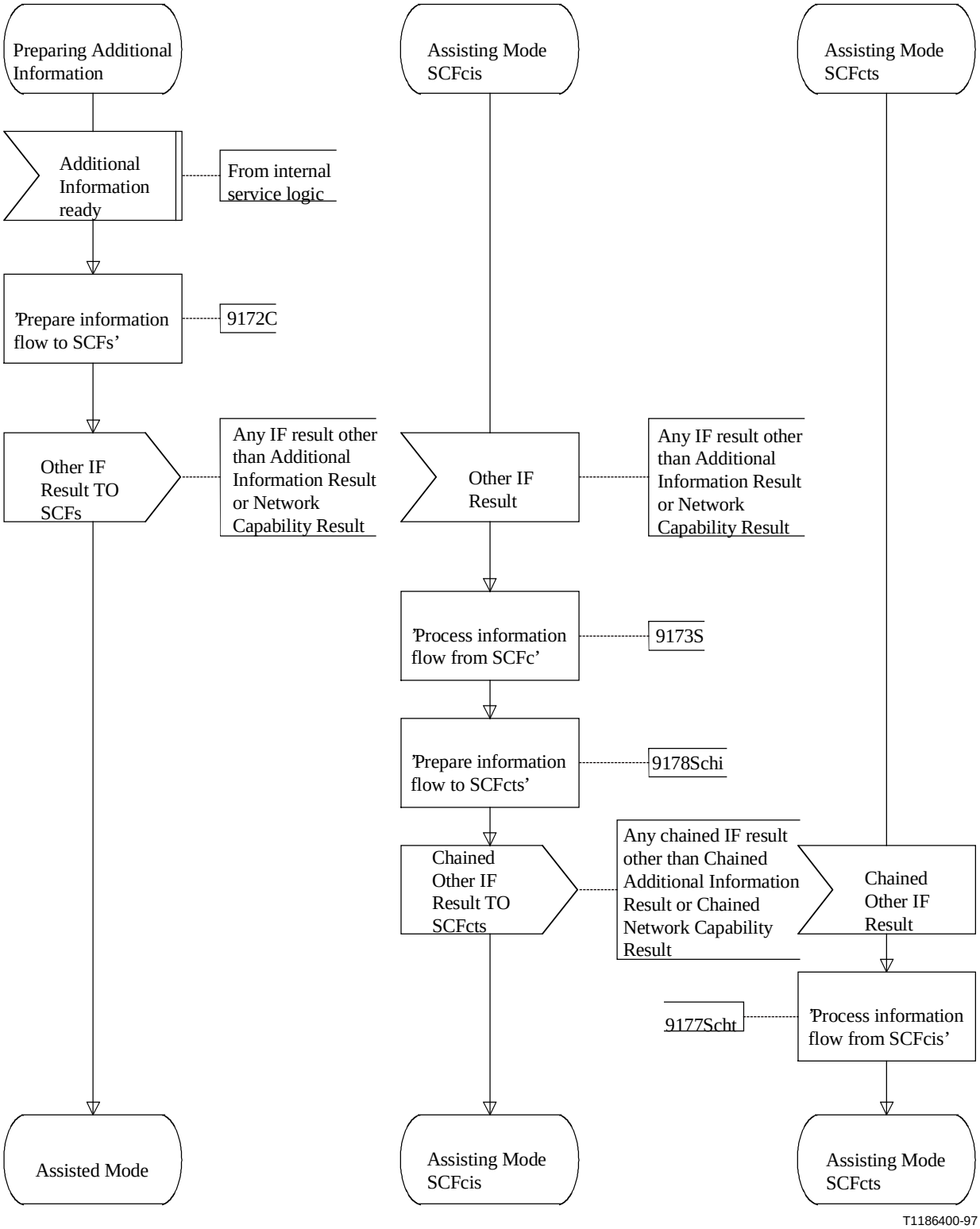


Figure 11-51/Q.1224 (sheet 4 of 4) – Controlling and supporting SCF actions for the MESSAGE HANDLER SIB, including chaining

11.2.10.4 Functional entity actions

Controlling SCF-related FEAs

Reference number	*Action*
9171C	Process information flow from supporting SCF
9172C	Prepare information flow to supporting SCF

Supporting SCF-related FEAs

Reference number	*Action*
9173S	Process information flow from controlling SCF
9174S	Prepare information flow to controlling SCF
9175Schi	Process information flow from chaining terminator supporting SCF
9176Scht	Prepare information information flow to chaining initiator supporting SCF
9177Scht	Process flow from chaining initiator supporting SCF
9178Schi	Prepare information flow to chaining terminator supporting SCF

11.2.11 QUEUE SIB

11.2.11.1 Description

QUEUE is a SIB that enables the SCF to manage the queuing of an IN call. Queuing capability includes:

– pass the call if resources are available;

– queue the call;

– play announcements to caller on queue (optional); the announcements may be repeated;

– when resource becomes available, dequeue the call.

The status of resources can be determined through status notification capability or by monitoring BCSM events. Only the latter case is addressed in this subclause. The playing of announcements uses the USER INTERACTION SIB capability.

If announcements are played to the caller on queue, then no other action to retain the call is required while the SRF is connected, although timers must be reset as required. If announcements are not played, then a Hold Call In Network req.ind. can be used to inform the SSF/CCF that the call has been queued and that the SSF/CCF should do all the activities necessary to keep the call waiting in the network.

11.2.11.2 Information flow diagrams

An example of how the QUEUE SIB capability might be provided is contained in the information flow diagrams, Figures 11-52, 11-53 and 11-54 and in the SDL diagrams, Figures 11-55 and 11-56. These figures combine the actions of the resource manager, dealing with resource availability and queue handling, and the sending and receiving of information flows, which are described by the distributed service logic. Further details of the distributed service logic may be found in the SDL diagrams of 11.5.

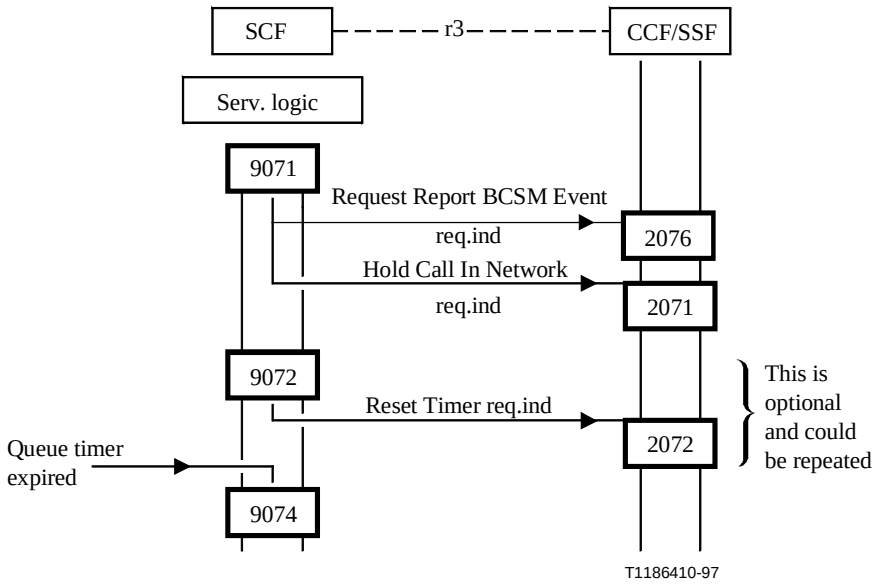
The QUEUE SIB capability may be offered to a caller for whom a particular resource is not available, provided that the resource is one for which queuing is active. All usage's of the particular category of resource must be monitored, so that when a resource is released by another caller the next request in the queue can be serviced. The example procedures shown in the diagrams here include:

– arming an EDP whenever a resource is used, to report when the resource becomes free again;

– arming the "user abandon" DP as an EDP, to ensure that the caller is removed from the queue on abandon;

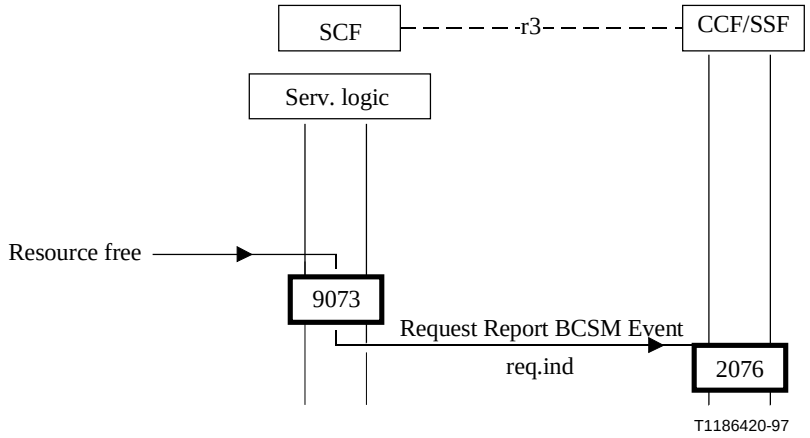
– setting timers and handling timer expiry.

More details on the methods available are contained in 12.4.5/Q.1228.



NOTE – Request Report BCSM Event is used here to arm an EDP-N to report user abandon.

Figure 11-52/Q.1224 – Information flow diagram for QUEUE SIB (queue without announcement)

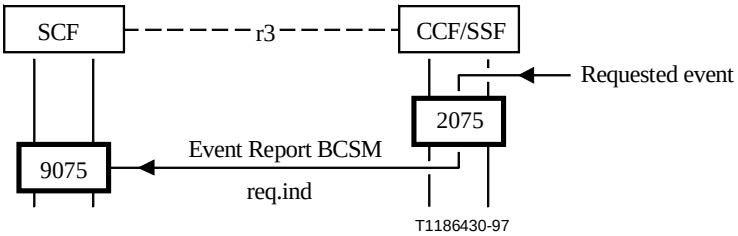


NOTE 1 – IF Reset Timer may also optionally be sent.

NOTE 2 – USER INTERACTION SIB announcement capabilities (several announcements, assist, etc.) may be used to play announcements while the call is queued.

NOTE 3 – The indication "resource free" here comes from another service logic instance. Request Report BCSM Event arms an EDP-N to report user disconnect, with the consequential release of the resource.

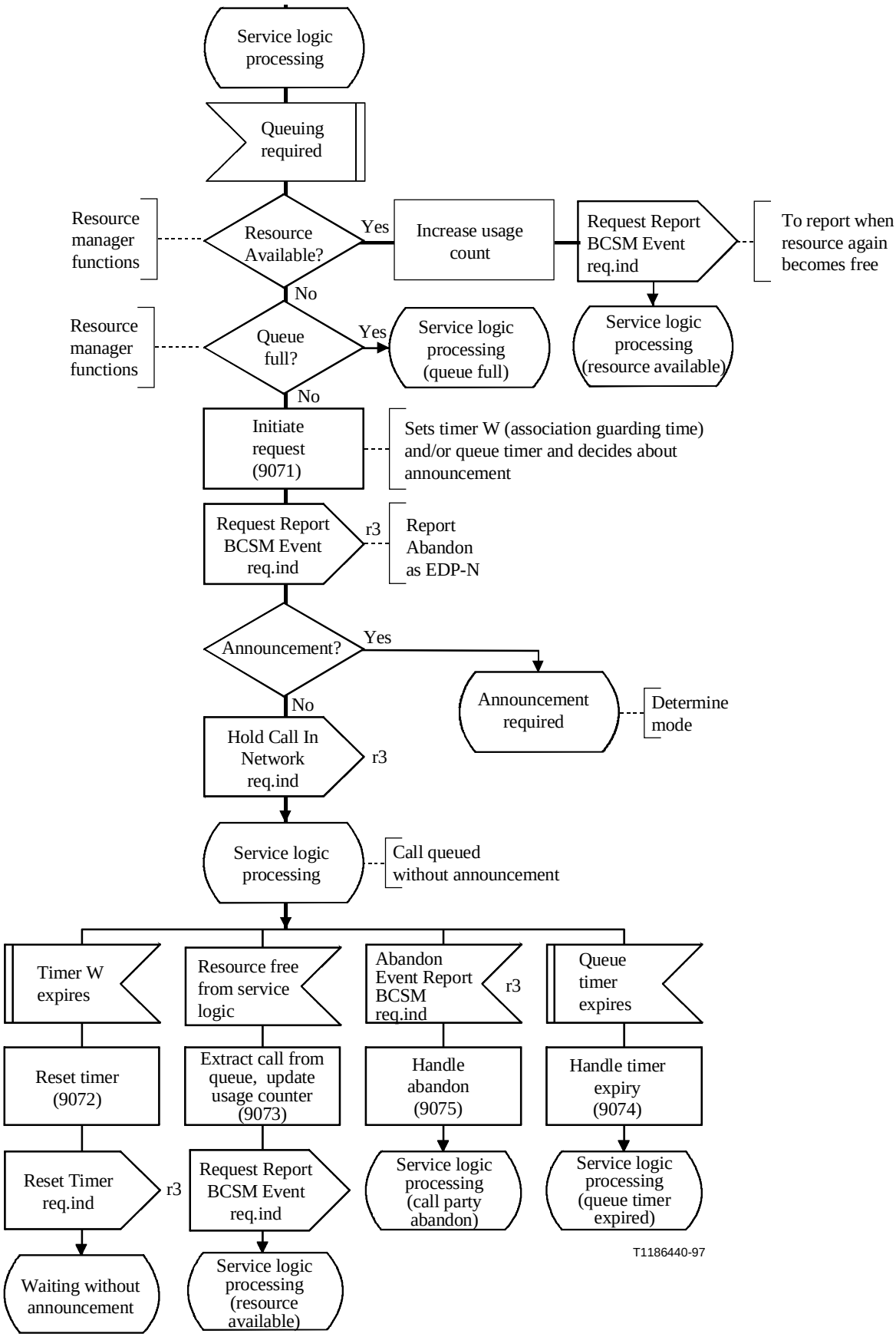
Figure 11-53/Q.1224 – Information flow diagram for QUEUE SIB (queue with an announcement)



NOTE – Event Report BCSM is used here to report user abandon or user disconnect.

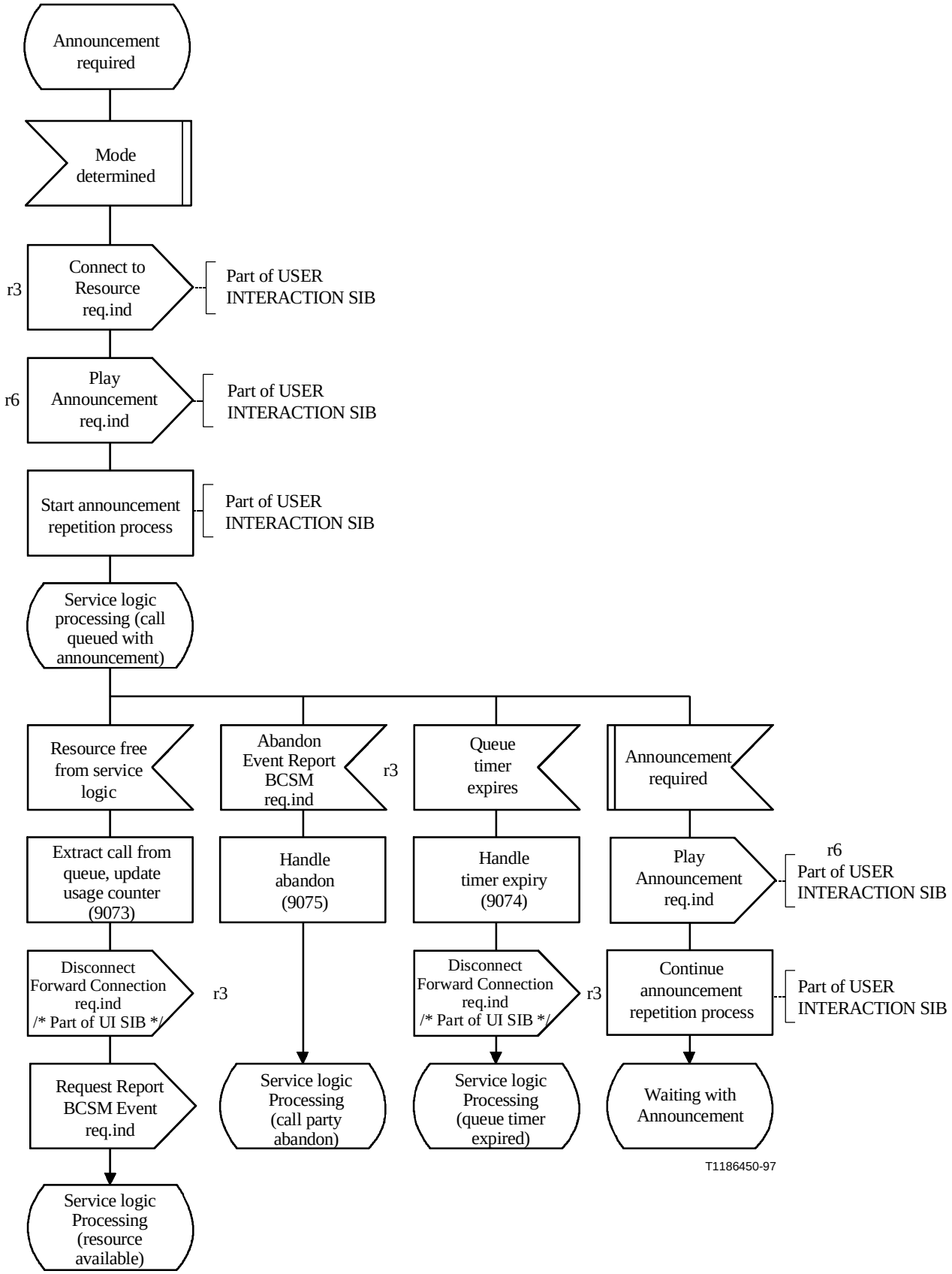
Figure 11-54/Q.1224 – Information flow diagram for QUEUE SIB (requested event)

11.2.11.3 SDLs



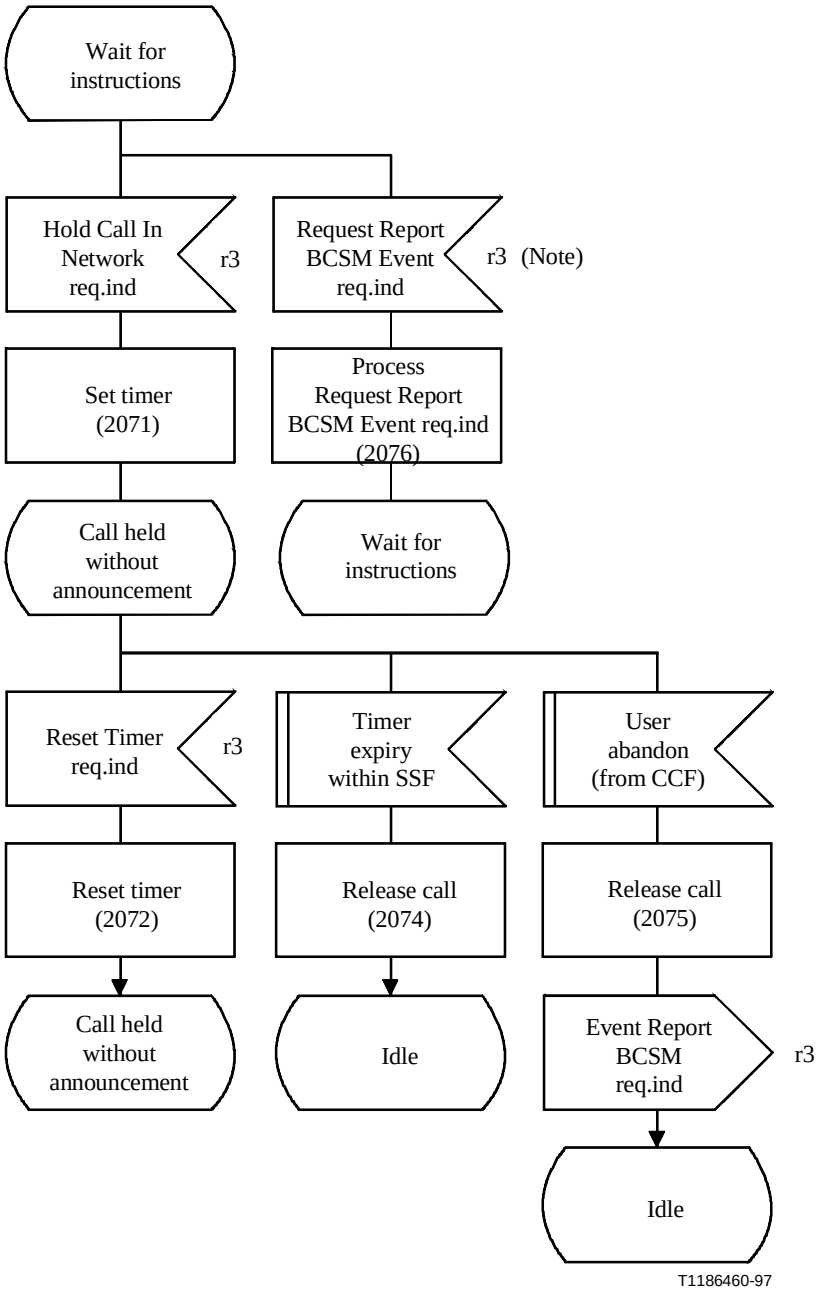
NOTE 1 – Timer W corresponds to timer Tscf-ssf in the distributed service logic SDLs.
NOTE 2 – All these events are handled by the resource manager.

Figure 11-55/Q.1224 (sheet 1 of 2) – SCF actions for QUEUE SIB



NOTE – Refer to USER INTERACTION SIB for depiction of cancelling a queue announcement.

Figure 11-55/Q.1224 (sheet 2 of 2) – SCF actions for QUEUE SIB



NOTE – The Request Report BCSM Event req.ind should be processed before the Hold Call In Network req.ind for correct processing of this SDL.

Figure 11-56/Q.1224 (sheet 1 of 2) – SSF actions for QUEUE SIB

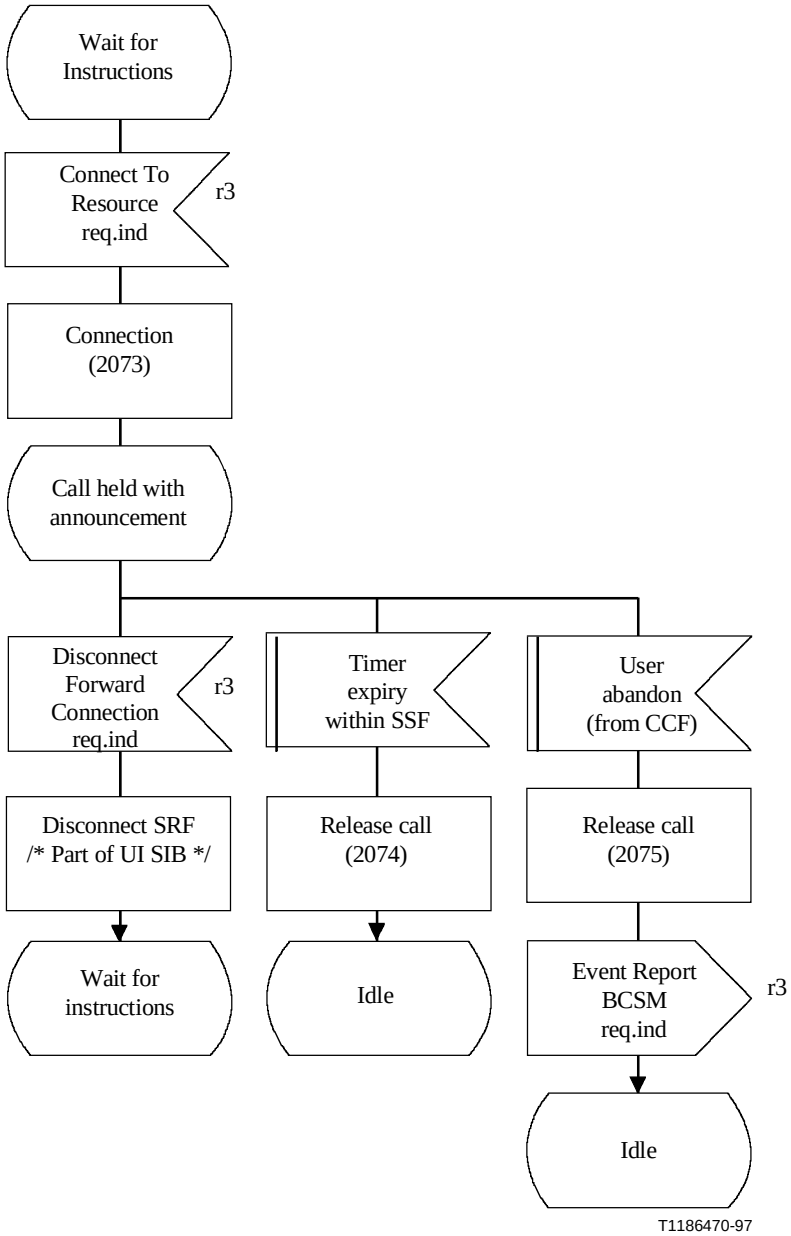


Figure 11-56/Q.1224 (sheet 2 of 2) – SSF actions for QUEUE SIB

NOTE – If a monitored resource is freed by another call, the SSF will report the event, but it is not part of the queuing process for the current call attempt.

11.2.11.4 Functional entity actions

SCF-related FEAs

Reference number		*Action*
9071	–	Initiate Request Report BCSM Event req.ind
	–	Initiate Hold Call In Network req.ind
	–	Store the call reference in the appropriate queue and adjust queue counter
	–	Arm a timer in order to be woken up to perform FEA 9072

9072	–	Wake up from timer set in FEA 9071
	–	Initiate Reset Timer req.ind
	–	Arm a timer in order to be woken up to start FEA 9072 again
9073	–	Dequeue call attempt based on availability of resource and adjust queue counter
	–	Update the resource status and queue counters (e.g. increases the line busy counter related to concerned destination)
	–	Send Request Report BCSM Event req.ind to arm EDP to report when resource becomes available
	–	Give control back to service logic with “resource available”
9074	–	Wake up from application queue timer
	–	Give control back to service logic with “timer expired”
9075	–	Receive Event Report BCSM req.ind, indicating user abandon or user disconnect
	–	Update the resource status and queue counters (e.g. decrease the line busy counter related to concerned destination)
	–	Give control back to service logic with “call party abandon” or "user disconnect"

SSF-related FEAs

Reference number		*Action*
2071	–	Receive Hold Call in Network req.ind
	–	Request the CCF to do all the activities necessary to keep the call waiting in the network
2072	–	Receive Reset Timer req.ind
	–	Update the value of the running timer in the SSF with the received value
2074	–	Wake up from the running timer in the SSF
	–	Take care of the release of all SSF resources on this call
2075	–	Receive a user abandon or user disconnect indication from the CCF
	–	Check that Report of user abandon or user disconnect was requested as EDP
	–	Send Event Report BCSM req.ind, indicating user abandon or user disconnect
	–	Release all SSF resources on this call.
2076	–	Receive Request Report BCSM Event req.ind from the SCF
	–	Arm the requested EDP

11.2.12 SCREEN SIB

11.2.12.1 Description

The SCREEN SIB provides the capability for the SCF to initiate a comparison of an identifier against a list located in a specified storage space in the SDF.

11.2.12.2 Information flow diagrams

Figure 11-57 depicts the information flows and functional entity actions to support screening functionality. The use of chaining and referral in SCREEN SIB is identical with the use in SERVICE DATA MANAGEMENT SIB. Data distribution requiring chaining and referral mechanism for data access is a matter only for the DFP and not for the GFP.

See the AUTHENTICATE SIB (11.2.2) for the description of the establishment of the authorized relationship between SCF and SDF which must precede the Search included in SCREEN SIB.

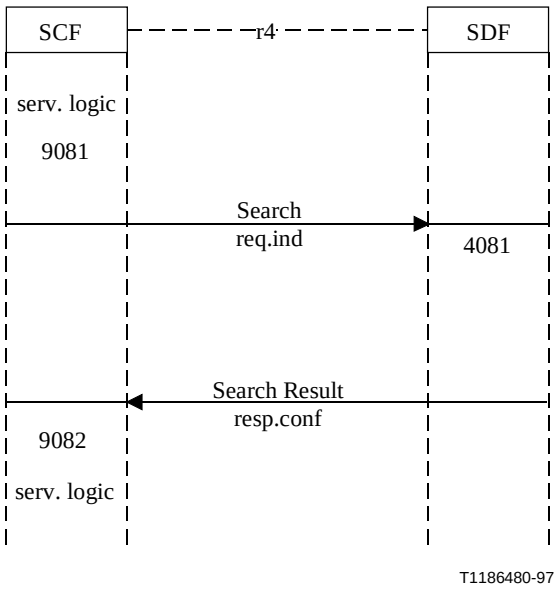


Figure 11-57/Q.1224 – Information flow diagram SCREEN SIB

11.2.12.3 SDLs

See Figures 11-58 and 11-59.

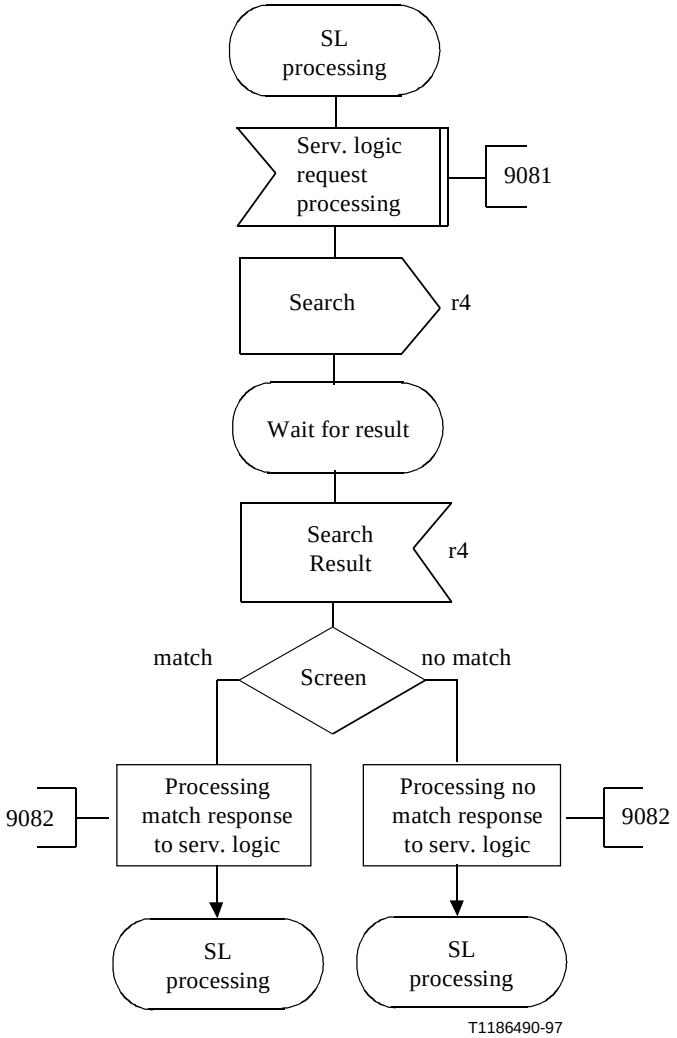


Figure 11-58/Q.1224 – SCF actions for SCREEN SIB

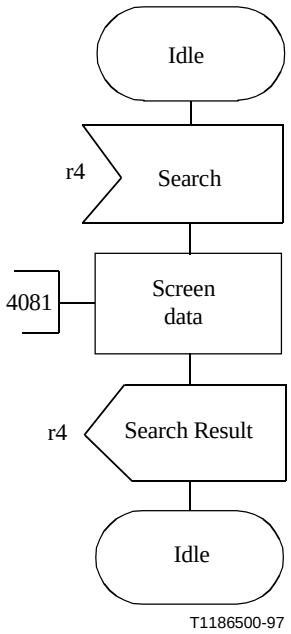


Figure 11-59/Q.1224 – SDF actions for SCREEN SIB

11.2.12.4 Functional entity actions

SCF-related FEAs

Reference number		*Action*
9081	–	Process request from service logic
	–	Generate and send a Search
9082	–	Receive Search Result
	–	Return response (match/no match) to service logic

SDF-related FEAs

Reference number		*Action*
4081	–	Receive and analyse a Search
	–	Screen data in the base
	–	Generate and send a Search Result

11.2.13 SERVICE DATA MANAGEMENT SIB

11.2.13.1 Description

The SERVICE DATA MANAGEMENT SIB provides the capability for the SCF to:

- retrieve specified data from the SDF;
- modify specified data in the SDF; and
- execute a data access script in the SDF.

A pair of generic information flows, SDM IF, and SDM IF Result, have been used to represent one pair of all the possible pairs of information flows:

- Search and Search Result.
- Modify Entry and Modify Entry Result.
- Add Entry and Add Entry Result.
- Remove Entry and Remove Entry Result.
- Execute and Execute Result.

Use of the pair of information flows is dependent on the requested action on data. Execute information flow requests the SDF to perform a data access script which encapsulates a number of data retrievals and modifications. In IN CS-2 the referral or chaining of any of the operations contained within a data access script is not permitted, as the information accessible to the data access script is required to be contained in a single SDF.

The information flow SDM IF Referral is defined in 12.8.2.12. It represents one of:

- Search Referral.
- Modify Entry Referral.
- Add Entry Referral.
- Remove Entry Referral.
- Execute Referral.

A pair of generic information flows, Chaining Request and Chaining Result, have been used to represent one pair of the possible pairs of information flows:

– Chained Search and Chained Search Result.

– Chained Modify Entry and Chained Modify Entry Result.

– Chained Add Entry and Chained Add Entry Result.

– Chained Remove Entry and Chained Remove Entry Result.

– Chained Execute and Chained Execute Result.

Chaining and referral mechanism for data access are depicted in the Stage 2 description. Such data distribution is a matter only for the DFP and not for the GFP.

See the AUTHENTICATE SIB (11.2.2) for the description of the establishment of the authorized relationship between SCF and SDF which must precede the SDM IF included in SERVICE DATA MANAGEMENT SIB.

11.2.13.2 Information flow diagrams

Figure 11-60 depicts the information flows and functional entity actions to support service data management functionality between SCF and SDF.

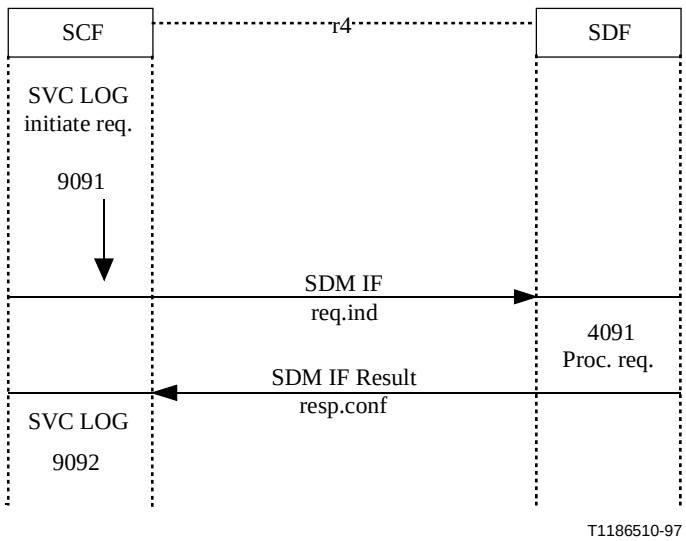
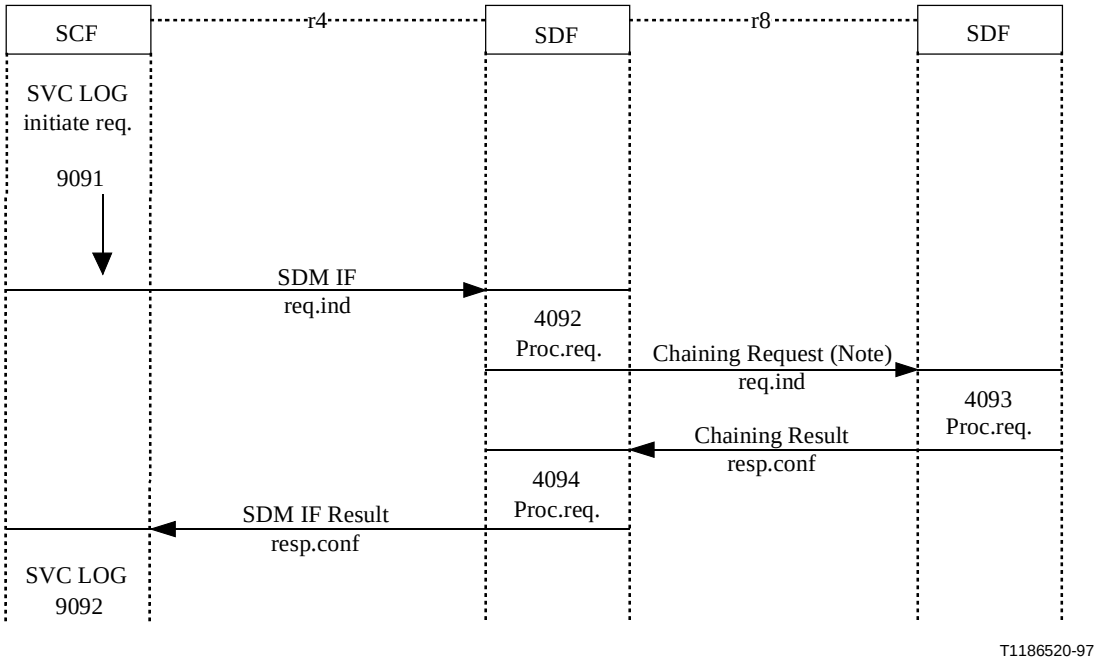


Figure 11-60/Q.1224 – Information flow diagram SERVICE DATA MANAGEMENT SIB

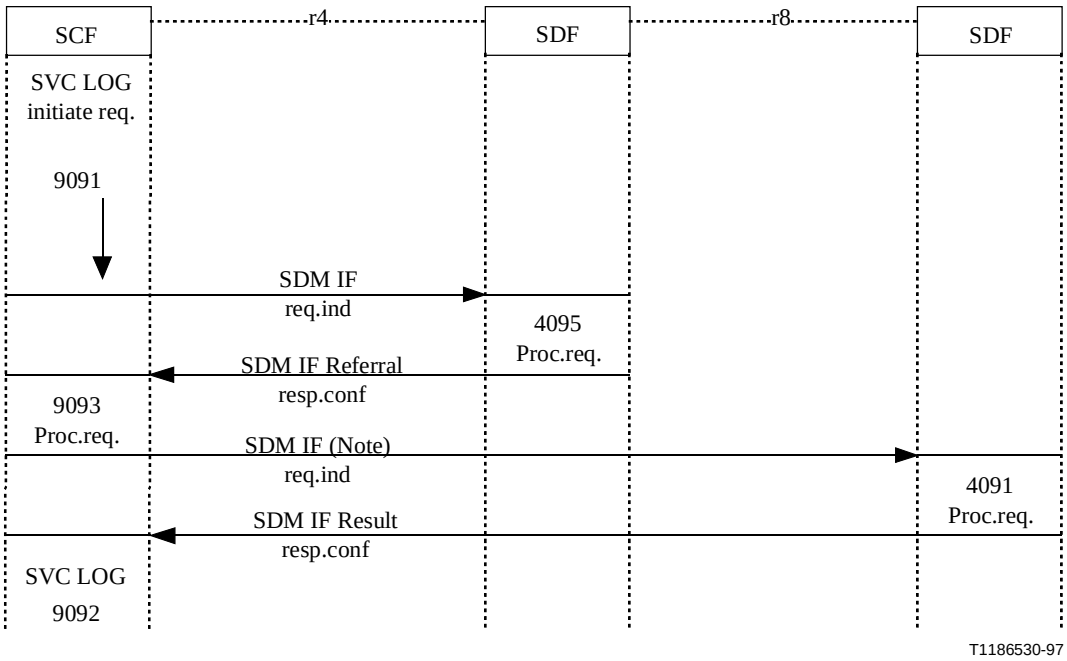
Figure 11-61 depicts the information flows and functional entity actions to support service data management functionality with Operation Chaining.



NOTE – Chained operation, Chaining Request, is functionally identical to the original information flow, SDM IF.

Figure 11-61/Q.1224 – Information flow diagram SERVICE DATA MANAGEMENT SIB with Operation Chaining

Figure 11-62 depicts the information flows and functional entity actions to support service data management functionality with Operation Referral.



NOTE – The second SDM IF is functionally identical to the first SDM IF.

Figure 11-62/Q.1224 – Information flow diagram SERVICE DATA MANAGEMENT SIB with Operation Referral

11.2.13.3 SDLs

Figure 11-63 is an SDL that shows the actions at an SCF involved in executing the SERVICE DATA MANAGEMENT SIB.

Figure 11-64 is an SDL that shows the actions at an SDF involved in executing the SERVICE DATA MANAGEMENT SIB.

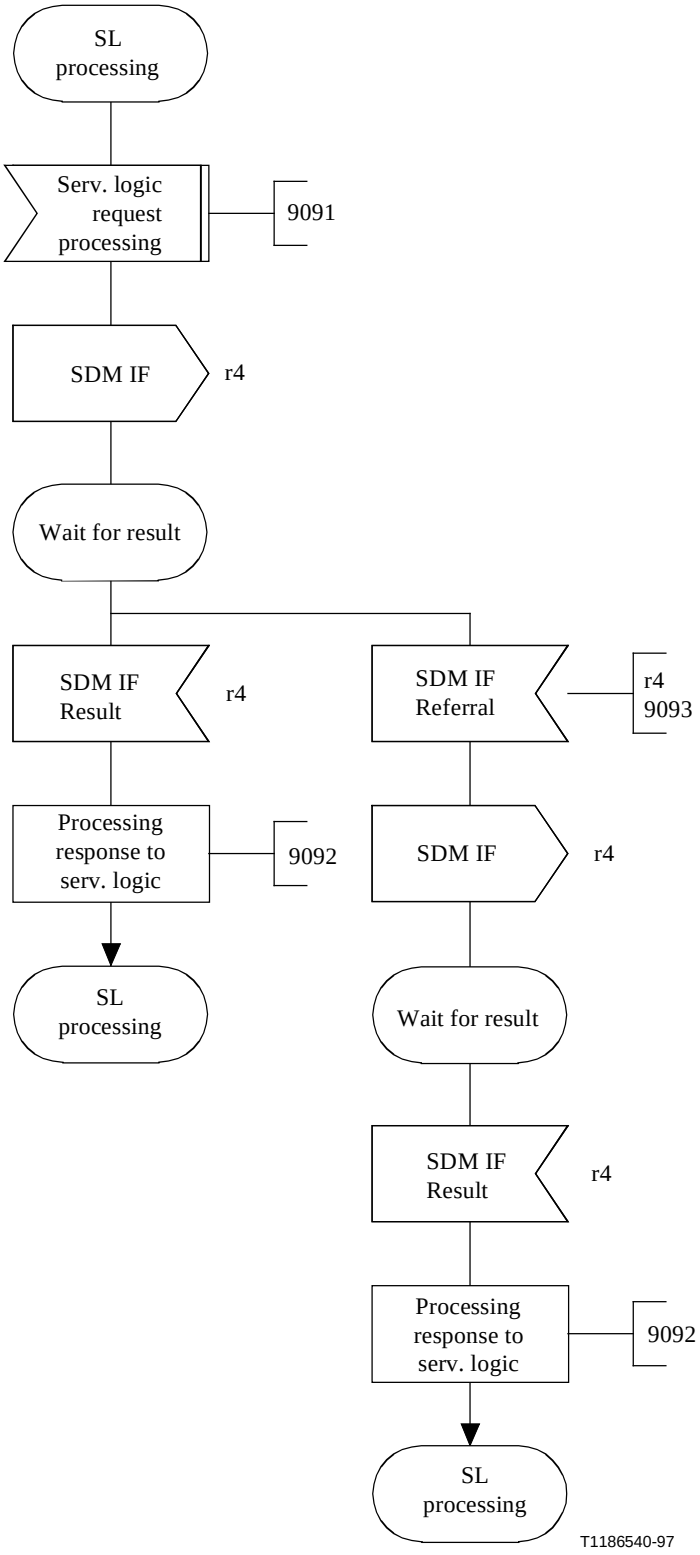


Figure 11-63/Q.1224 – SCF actions for SERVICE DATA MANAGEMENT SIB

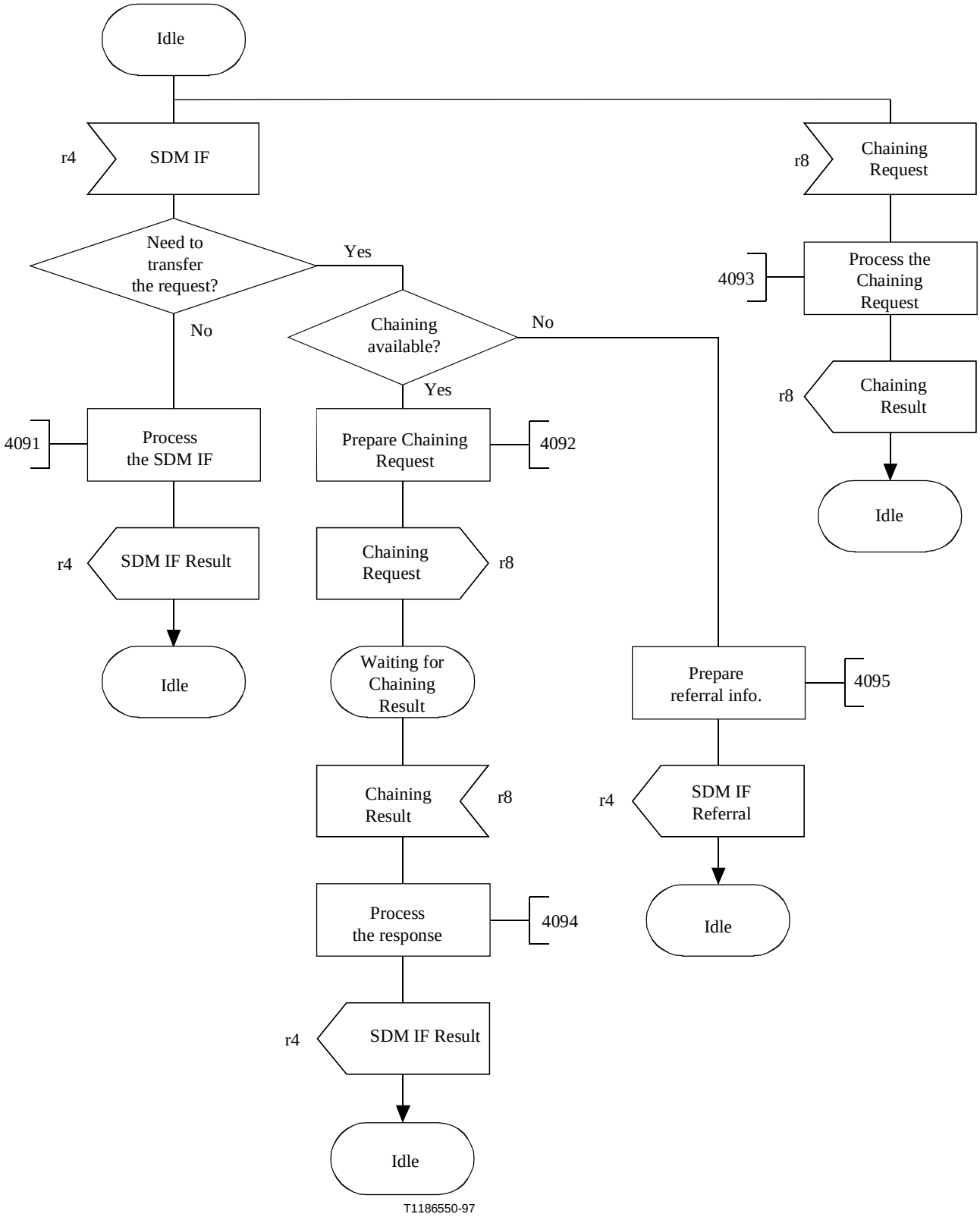


Figure 11-64/Q.1224 – SDF actions for SERVICE DATA MANAGEMENT SIB

11.2.13.4 Functional entity actions

SCF-related FEAs

Reference number		*Action*
9091	–	Process request from service logic
	–	Generate and send an SDM IF
9092	–	Receive SDM IF Result
	–	Return response to service logic
9093	–	Receive SDM IF Referral for permitted information flows
	–	Analyse the SDM IF Referral and get referral information
	–	Generate and send a SDM IF to another SDF

SDF-related FEAs

Reference number		*Action*
4091	–	Receive and analyse SDM IF
	–	Process data in the base
	–	Generate and send an SDM IF Result
4092	–	Receive and analyse SDM IF
	–	If appropriate, generate and send a Chaining Request to another SDF
4093	–	Receive and analyse Chaining Request IF
	–	Process data in the base
	–	Generate and send a Chaining Result
4094	–	Receive and analyse Chaining Result
	–	Generate and send SDM IF Result
4095	–	Receive and analyse SDM IF
	–	Generate and send SDM IF Referral

11.2.14 SERVICE FILTER SIB

11.2.14.1 Description

The SERVICE FILTER SIB limits the number of calls that are allowed through an IN-structured network by filtering calls with given characteristics. The filtering is applied only to those calls related to IN-provided service features that request the assistance of IN functions (i.e. applies to all TDPs). Calls are blocked at the SSF and provided treatment for a specified duration (which may be infinite) at specified intervals. Service filtering is subscriber initiated. A service logic program sends an Activate Service Filtering req.ind information flow. Calls that do not request the assistance of IN functions ("non IN-provided calls") are not affected by this SIB.

The SERVICE FILTER SIB functionality can be supported entirely in the SCF, or distributed between the SCF and the SSF. The former functionality does not require additional information flows beyond those described for other SIBs. The latter functionality is described in this subclause.

11.2.14.2 Information flow diagrams

Figure 11-65 depicts the information flows and functional entity actions to support service filtering functionality for service execution purposes.

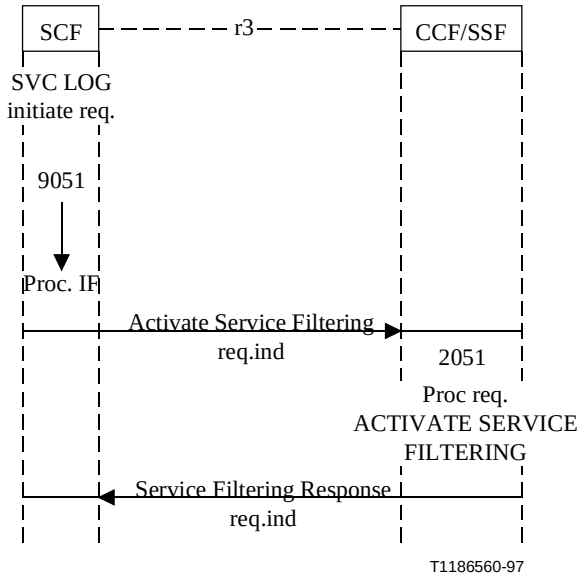


Figure 11-65/Q.1224 – Information flow diagram SERVICE FILTER SIB

11.2.14.3 SDLs

Figure 11-66 presents the SDL diagram for the SCF processing of the SERVICE FILTER SIB functionality.

Figure 11-67 presents the SDL diagram for the CCF/SSF processing of the SERVICE FILTER SIB functionality.

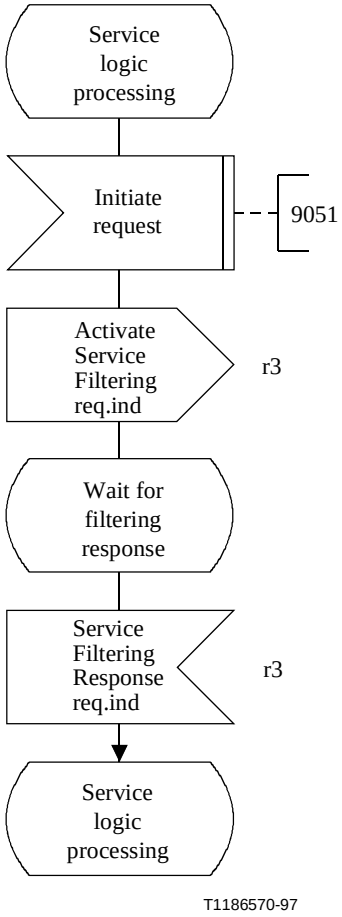


Figure 11-66/Q.1224 – SCF actions for the SERVICE FILTER SIB

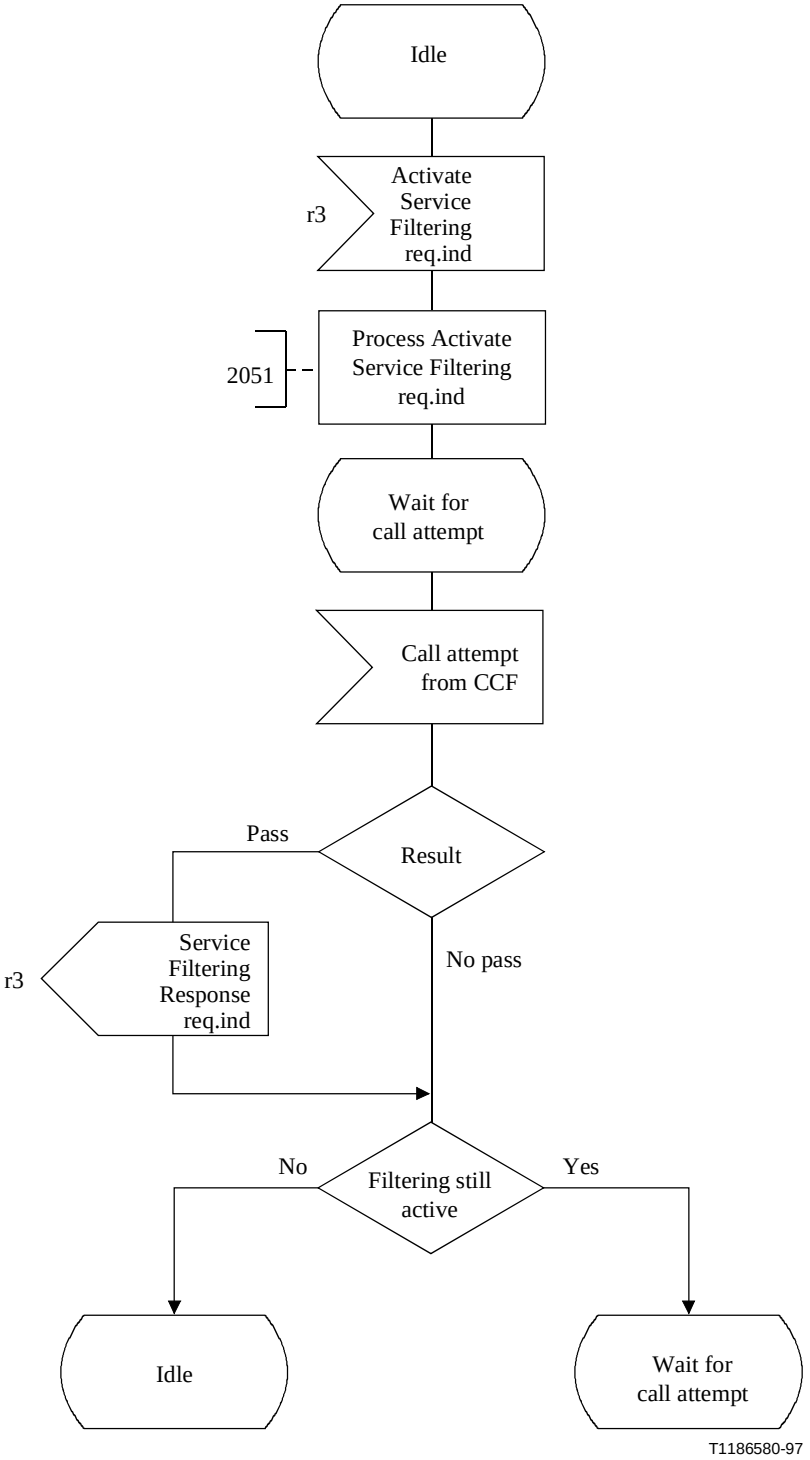


Figure 11-67/Q.1224 – CCF/SSF actions for the SERVICE FILTER SIB

11.2.14.4 Functional entity actions

SCF-related FEAs

Reference number	*Action*
9051	Initiate request – Initiate an Activate Service Filtering req.ind

SSF-related FEAs

Reference number	Action
2051	Process Activate Service Filtering req.ind – Receive and analyse Activate Service Filtering req.ind – Apply specified filtering at specified intervals for specified duration – When required, send Service Filtering Response req.ind with number of calls filtered with specified characteristics

11.2.15 SPLIT SIB

11.2.15.1 Description

The SPLIT SIB provides the capability to detach a leg from a call segment. The SIB is used to move a call party from a call segment and put the moved call party into a new call segment. All the associated events will be known in the context of the call segment that contains the split call party.

11.2.15.2 Information flow diagrams

Figure 11-68 depicts the information flows and the functional entity actions to support the split CPH capabilities.

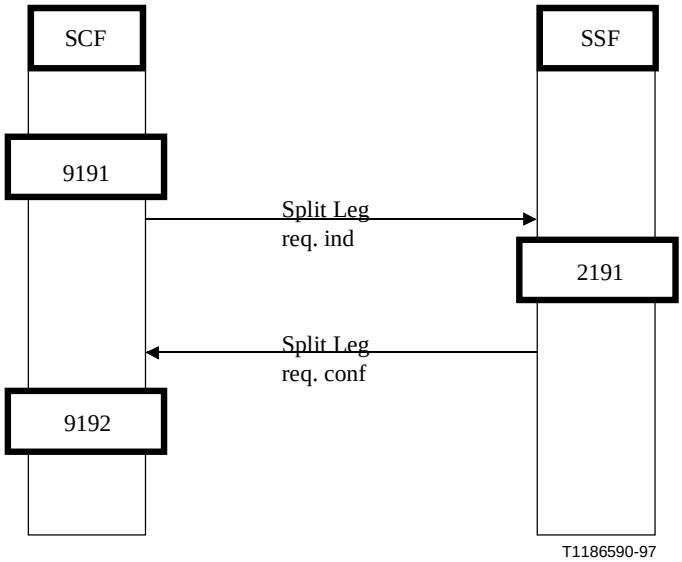


Figure 11-68/Q.1224 – Information flow diagram SPLIT SIB

11.2.15.3 SDLs

Figure 11-69 presents the SDL diagram for the SCF processing of the SPLIT SIB.

Figure 11-70 presents the SDL diagram for the SSF processing of the SPLIT SIB.

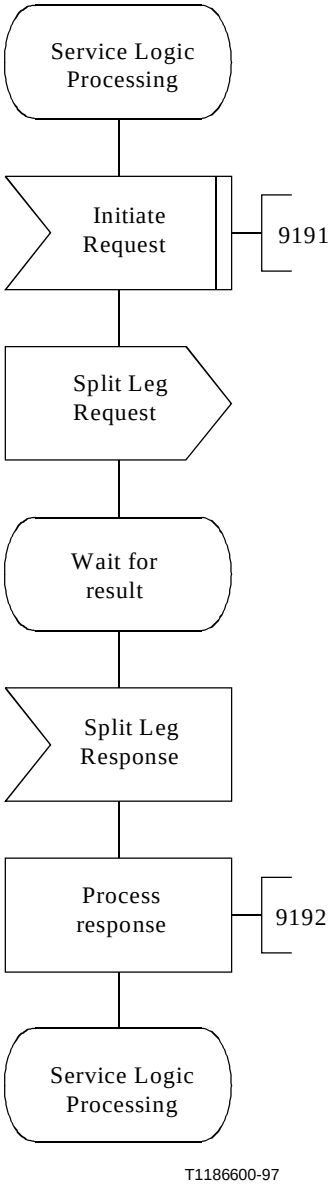


Figure 11-69/Q.1224 – SCF actions for SPLIT SIB

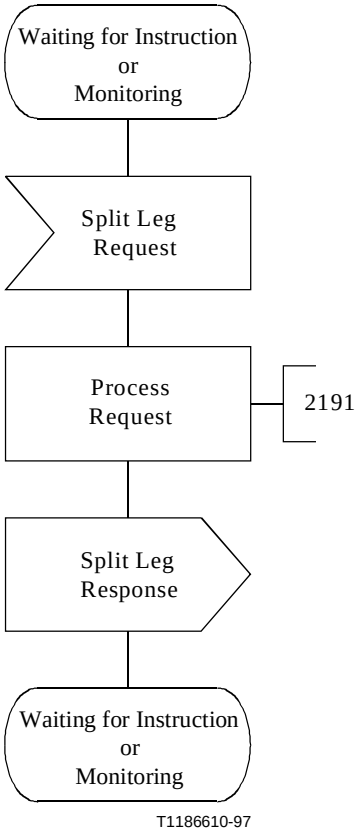


Figure 11-70/Q.1224 – SSF actions for SPLIT SIB

11.2.15.4 Functional entity actions

SCF-related FEAs

Reference Number	*Action*
9191	Initiate request
	– Initiate a Split Leg req.ind
9192	Process Split Leg resp.conf
	– Receive and analyse Split Leg resp. conf
	– Return response to service logic

SSF-related FEAs

Reference Number	*Action*
2191	Process Split Leg req. ind
	– Receive and analyse Split Leg req. ind
	– Apply call party handling procedure
	– Return Split Leg resp. conf

11.2.16 STATUS NOTIFICATION SIB

11.2.16.1 Description

The STATUS NOTIFICATION SIB provides the capability for the SCF to keep track of the status of network calls or resources and optionally to store the status in the SDF. For example, this SIB is used to determine the busy/idle status of a line to a called party. The SCF requests the CCF/SSF to notify it of the busy/idle status of a call or resource by sending a Request Status Report req.ind of type "poll resource status," "monitor for change," or "continuous monitor." These types can request the CCF/SSF to return the status immediately, or to wait until the specified resource assumes a particular busy/idle status, or to report each time the resource changes status. The resource can be, for example, a non-ISDN line, a directory number associated with an ISDN interface, a MultiLine Hunt Group (MLHG), or a Trunk Group (TG).

The CCF/SSF sends a Status Report req.ind to report the status of the call or resource to the SCF. The SCF then optionally communicates with the SDF to update its busy/idle status information. The Request Status Report req.ind of type "monitor for change," or "continuous monitor" may include a monitor duration parameter that requests the CCF/SSF to monitor busy/idle status of the resource for a limited time. The SCF may also request the CCF/SSF to end status notification for a resource if the CCF/SSF is waiting for a change in status or reporting all changes. The SCF does this by sending the Cancel Status Report Request req.ind to the CCF/SSF.

11.2.16.2 Information flow diagrams

Figure 11-71 depicts the information flows and functional entity actions to support status notification functionality for type "poll resource status".

Figure 11-72 depicts the information flows and functional entity actions to support status notification functionality for type "monitor for change".

Figure 11-73 depicts the information flows and functional entity actions to support status notification functionality of type "continuous monitor".

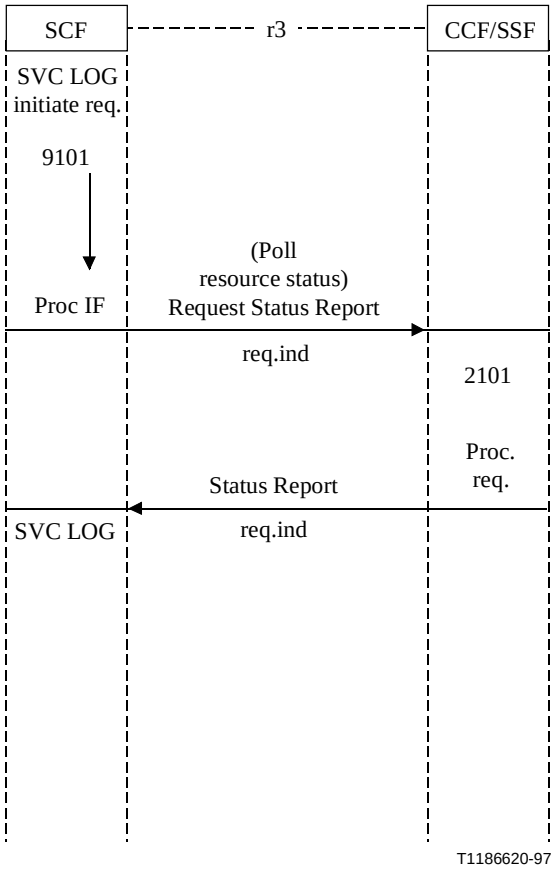


Figure 11-71/Q.1224 – Information flow diagram STATUS NOTIFICATION SIB (poll resource status)

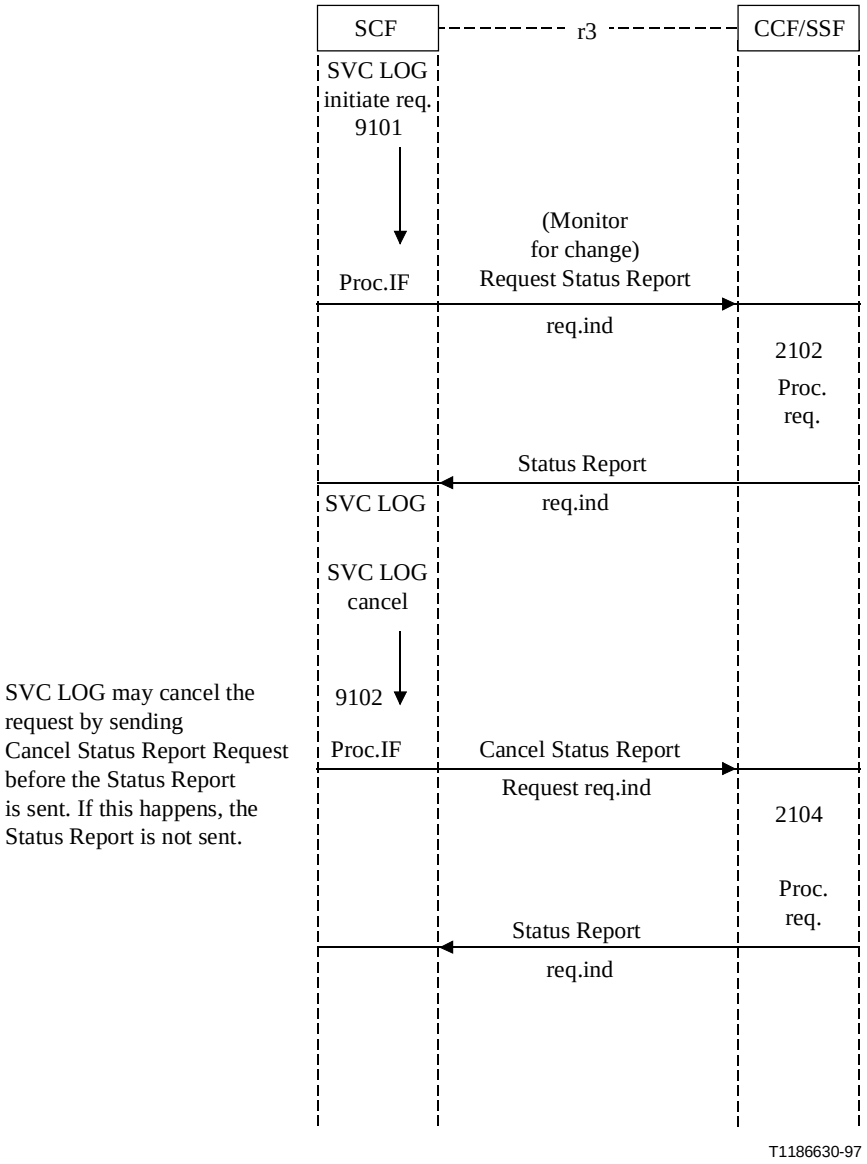


Figure 11-72/Q.1224 – Information flow diagram STATUS NOTIFICATION SIB (monitor for change)

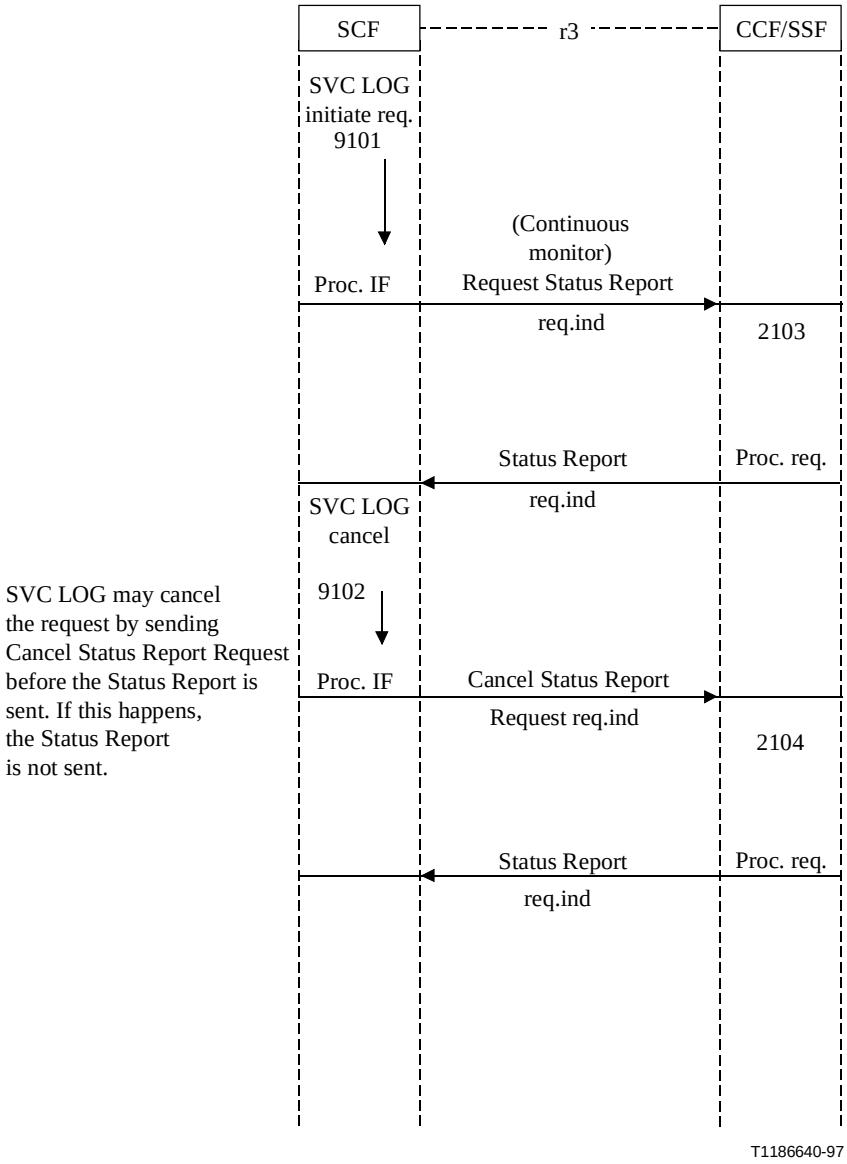


Figure 11-73/Q.1224 – Information flow diagram STATUS NOTIFICATION SIB (continuous monitor)

11.2.16.3 SDLs

Figure 11-74 presents the SDL diagram for the SCF processing of the STATUS NOTIFICATION SIB functionality.

Figure 11-75 presents the SDL diagram for the CCF/SSF processing of the STATUS NOTIFICATION SIB functionality.

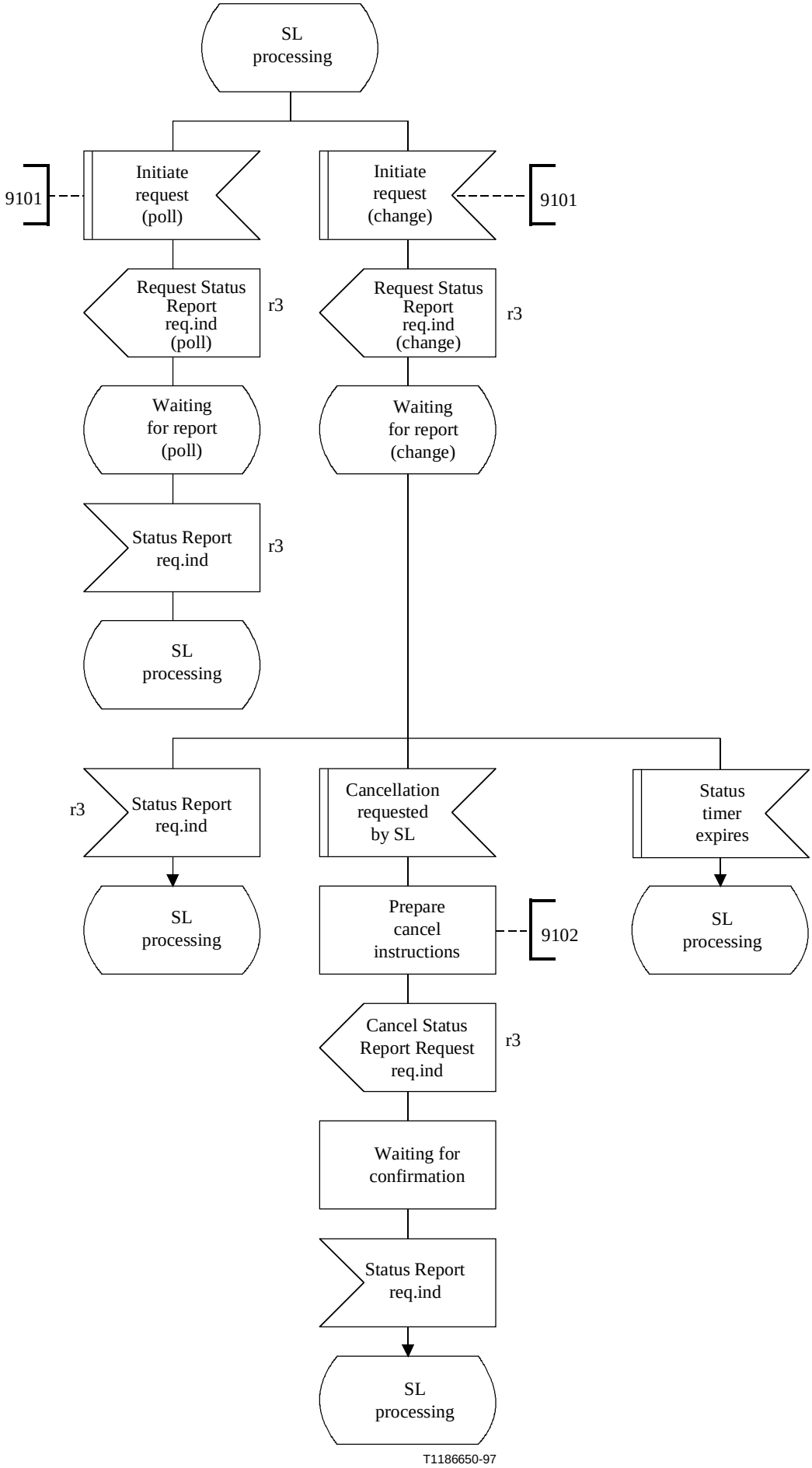


Figure 11-74/Q.1224 (sheet 1 of 2) – SCF actions for STATUS NOTIFICATION SIB

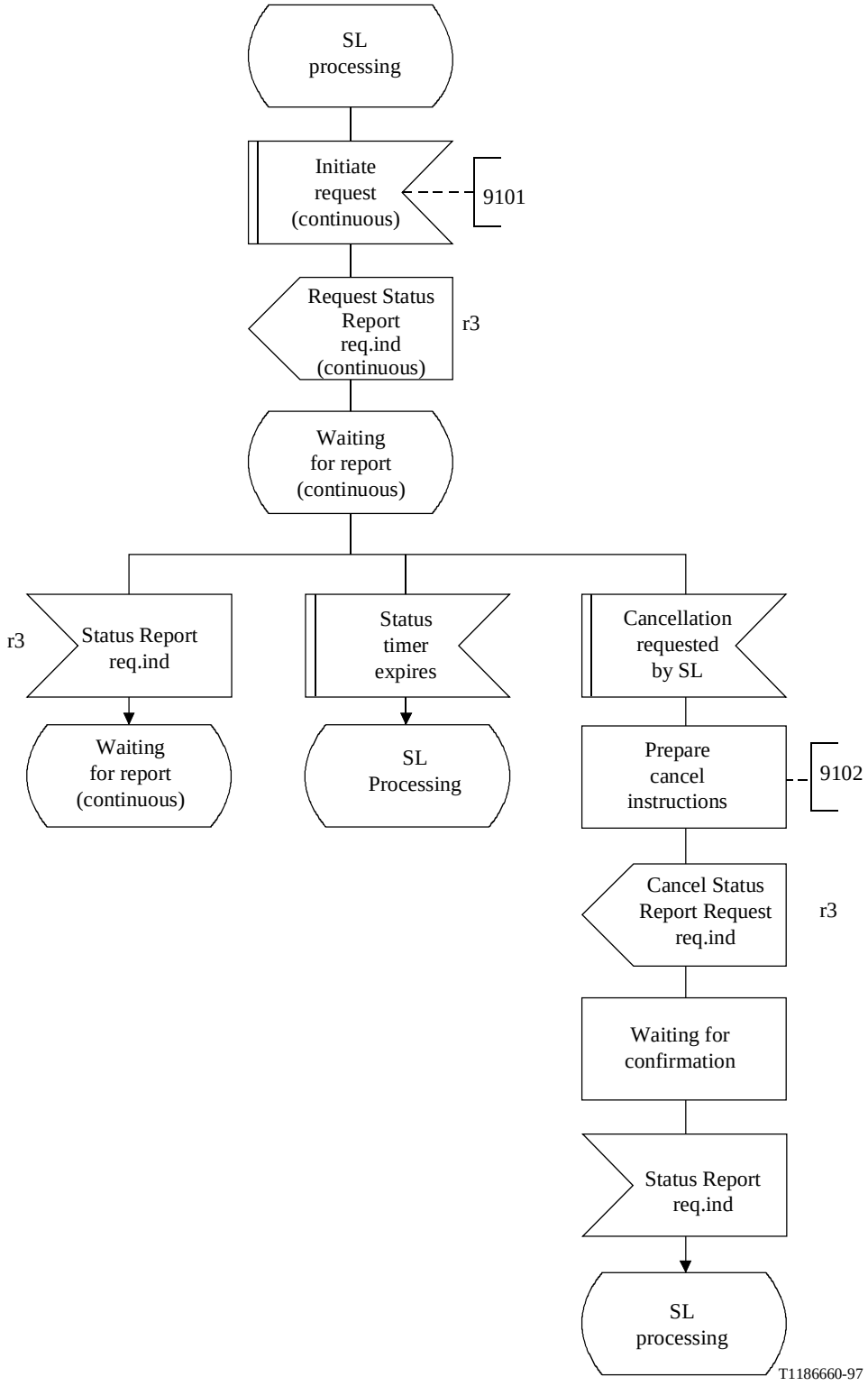


Figure 11-74/Q.1224 (sheet 2 of 2) – SCF actions for STATUS NOTIFICATION SIB

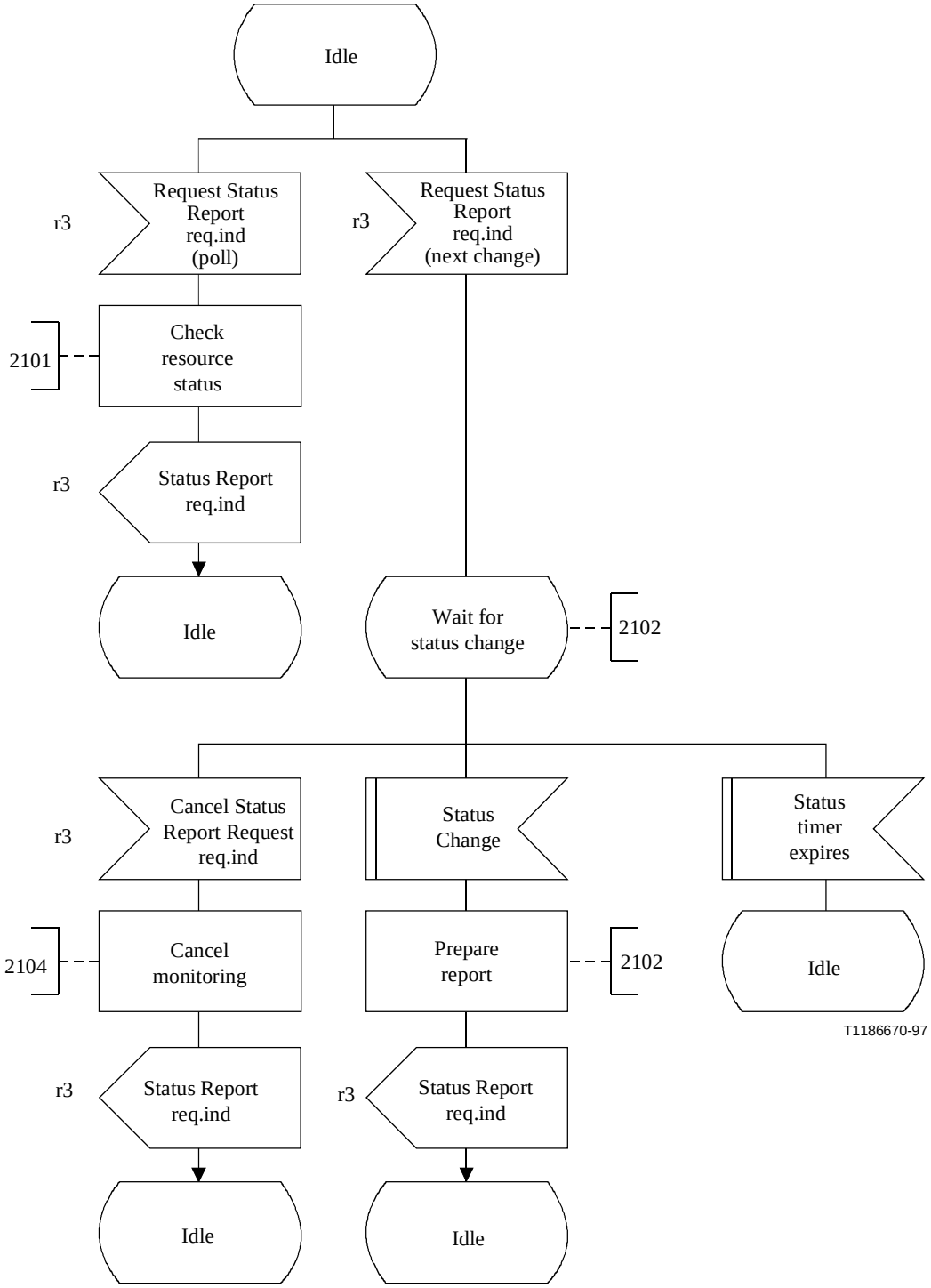


Figure 11-75/Q.1224 (sheet 1 of 2) – CCF/SSF actions for STATUS NOTIFICATION SIB

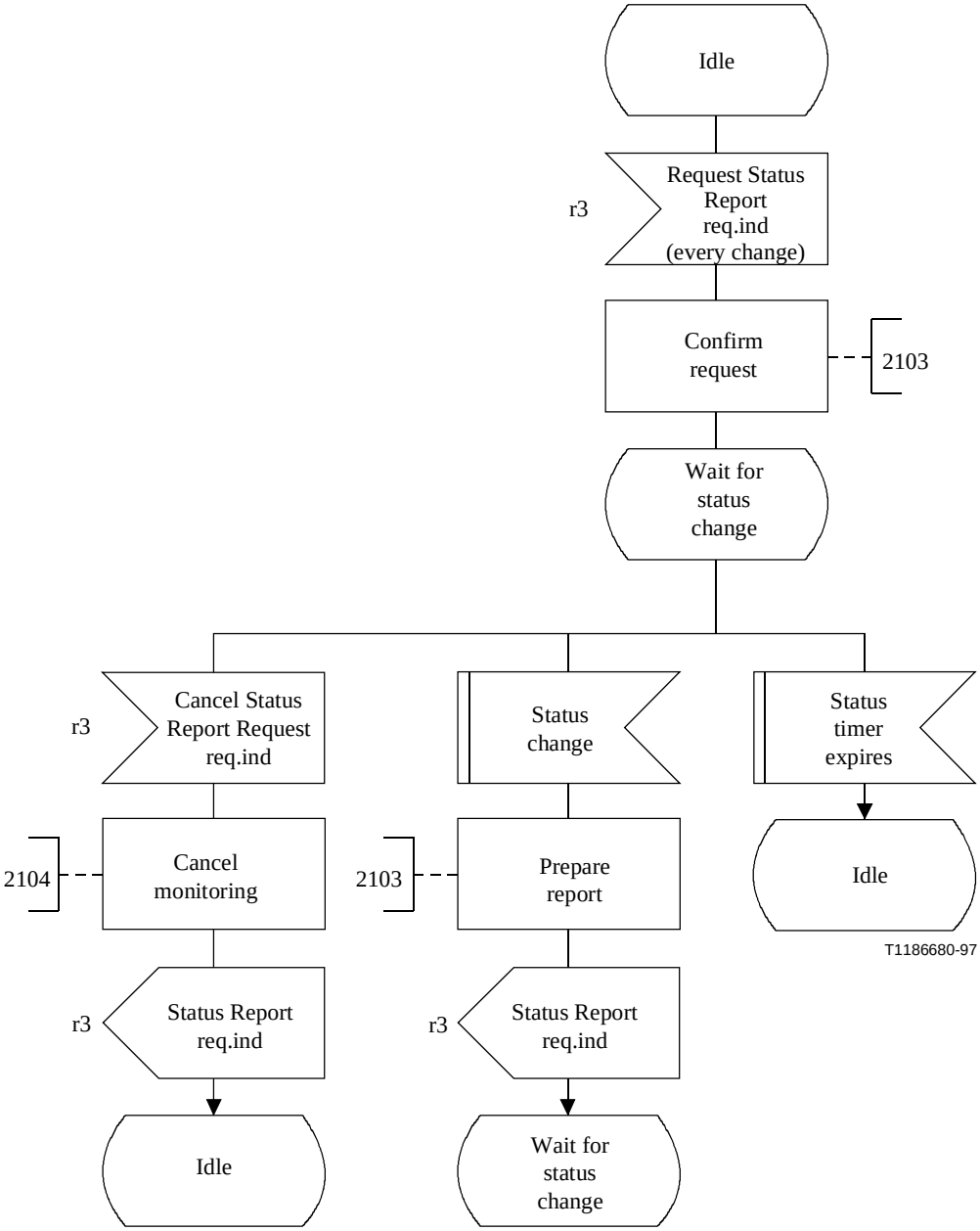


Figure 11-75/Q.1224 (sheet 2 of 2) – CCF/SSF actions for STATUS NOTIFICATION SIB

11.2.16.4 Functional entity actions

SCF-related FEAs

Reference Number	*Action*
9101	Initiate request
	– Initiate a Request Status Report req.ind
	– Wait for Status Report resp.conf
9102	Initiate request
	– Initiate a Cancel Status Report Request req.ind

SSF-related FEAs

Reference Number	*Action*
2101	Process Request Status Report req.ind of type “poll resource status”
	– Receive and analyse Request Status Report req.ind
	– Determine current status of resource
	– Return Status Report req.ind
2102	Process Request Status Report req.ind of type “monitor for change”
	– Receive and analyse Request Status Report req.ind
	– Set monitor duration if specified
	– Determine if resource is specified status, if so return Status Report req.ind, and if not wait for resource to change to specified status or duration expires or a Cancel Status Report Request req.ind is received
	– When resource changes to specified status, return Status Report req.ind
2103	Process Request Status Report req.ind of type “continuous monitor”
	– Receive and analyse Request Status Report req.ind
	– Set monitor duration if specified
	– Report changes in status until duration expires or a Cancel Status Report Request req.ind is received
	– When status changes, return Status Report req.ind
2104	Process Cancel Status Report Request req.ind
	– Receive and analyse Cancel Status Report Request req.ind
	– Send Status Report req.ind to report cancellation

11.2.17 TRANSLATE SIB

11.2.17.1 Description

TRANSLATE is a SIB that provides a translation capability by an SDF for an SCF. For example, it can be used to modify a functional number into a valid destination address and to provide translations based on other input parameters.

11.2.17.2 Information flow diagrams

Figure 11-76 is a diagram that depicts information flows and functional entity actions involved in executing the TRANSLATE SIB. The use of chaining and referral in TRANSLATE SIB is identical with the use in SERVICE DATA MANAGEMENT SIB. Data distribution requiring chaining and referral mechanism for data access is a matter only for the DFP and not for the GFP.

See the AUTHENTICATE SIB (11.2.2) for the description of the establishment of the authorized relationship between SCF and SDF which must precede the Search or execute included in TRANSLATE SIB.

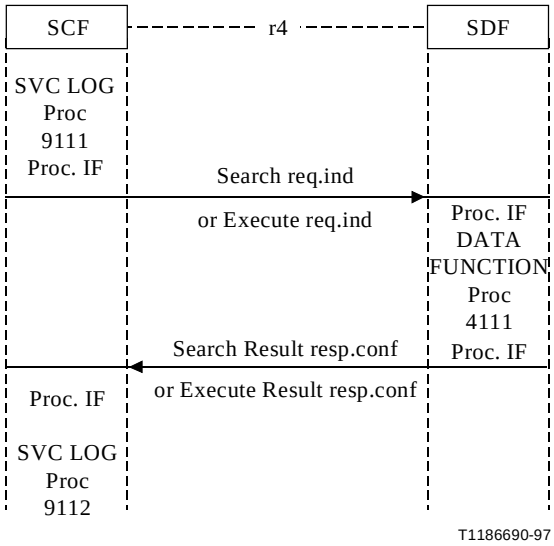


Figure 11-76/Q.1224 – Information flow diagram TRANSLATE SIB

11.2.17.3 SDLs

Figure 11-77 presents the SDL diagram for the SCF processing of a TRANSLATE SIB. Figure 11-78 presents the SDL diagram for the SDF involved in processing a TRANSLATE SIB.

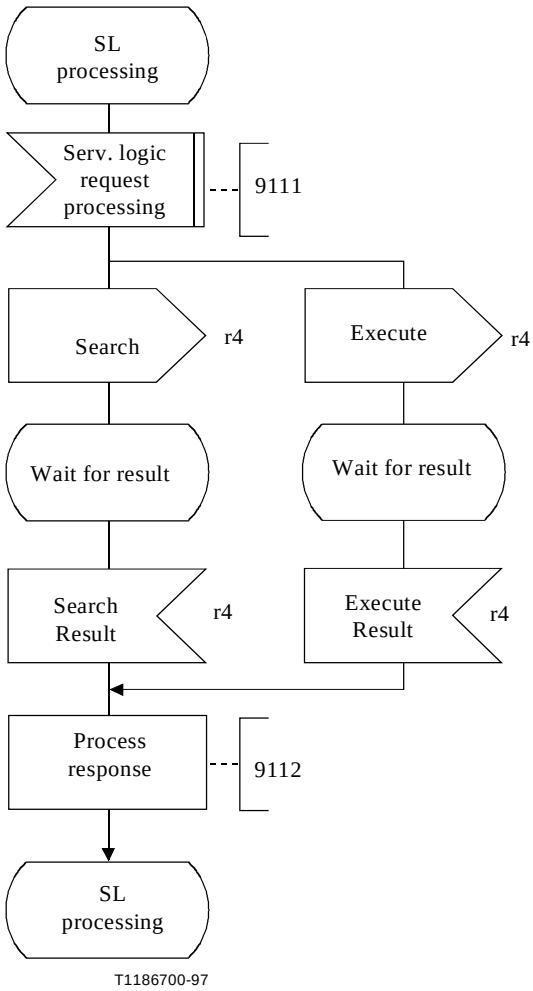


Figure 11-77/Q.1224 – SCF actions for TRANSLATE SIB

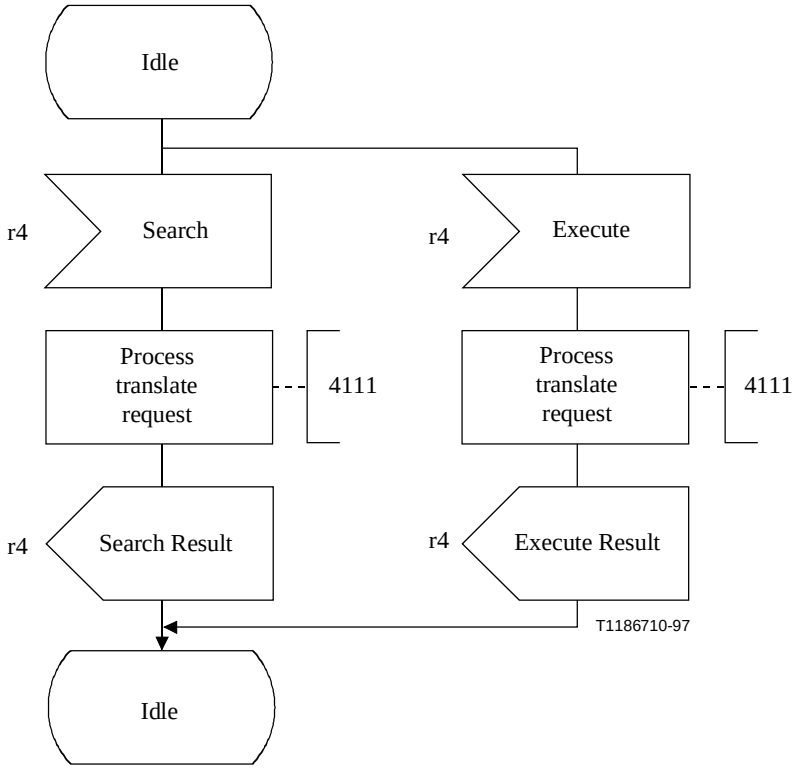


Figure 11-78/Q.1224 – SDF actions for TRANSLATE SIB

11.2.17.4 Functional entity actions

SCF-relates FEAs

Reference number	*Action*
9111	Initiate translation process
	– Formulate and send Search (or Execute)
9112	Receive and analyse Search (or Execute) Result
	– Process information as required

SDF-relates FEAs

Reference number	*Action*
4111	Receive and analyse a Search (or Execute)
	– Determine translation based on available reference information
	– Process information as required
	– Formulate and send Search (or Execute) Result

11.2.18 USER INTERACTION SIB

11.2.18.1 Description

USER INTERACTION is a SIB wherein the SCF directs the connection of a user to a specialized resource (i.e. SRF), the playing of an announcement toward and, in some cases, the collection of information from a user. The announcement and/or collected information can be in the form of audio messages, DTMF tones, etc.

A single USER INTERACTION SIB includes all the required SIB operations and data to invoke an elementary user interaction capability or to invoke a user interaction script. The user interaction script is defined as a set of elementary operations such as Play Announcement and Prompt and Collect User Information. During the user interaction script execution the SRF may need additional information from the SCF. A user interaction script is user interaction logic stored in the SRF so that when the user interaction script is invoked, the SCF is still responsible for the global service logic and the SRF is only responsible for the user interaction logic.

If Play Announcement or Prompt and Collect User Information has been sent to the SRF and the elementary operation (e.g. Play Announcement) has finished, then Script Run information flow can be sent to start script execution. Once script execution has started, it must be finished by SCF sending a Script Close information flow. Once Script Close information flow has been received, then Play Announcement, Prompt and Collect User Information or Script Run information flows can be repeated accordingly to the rules above.

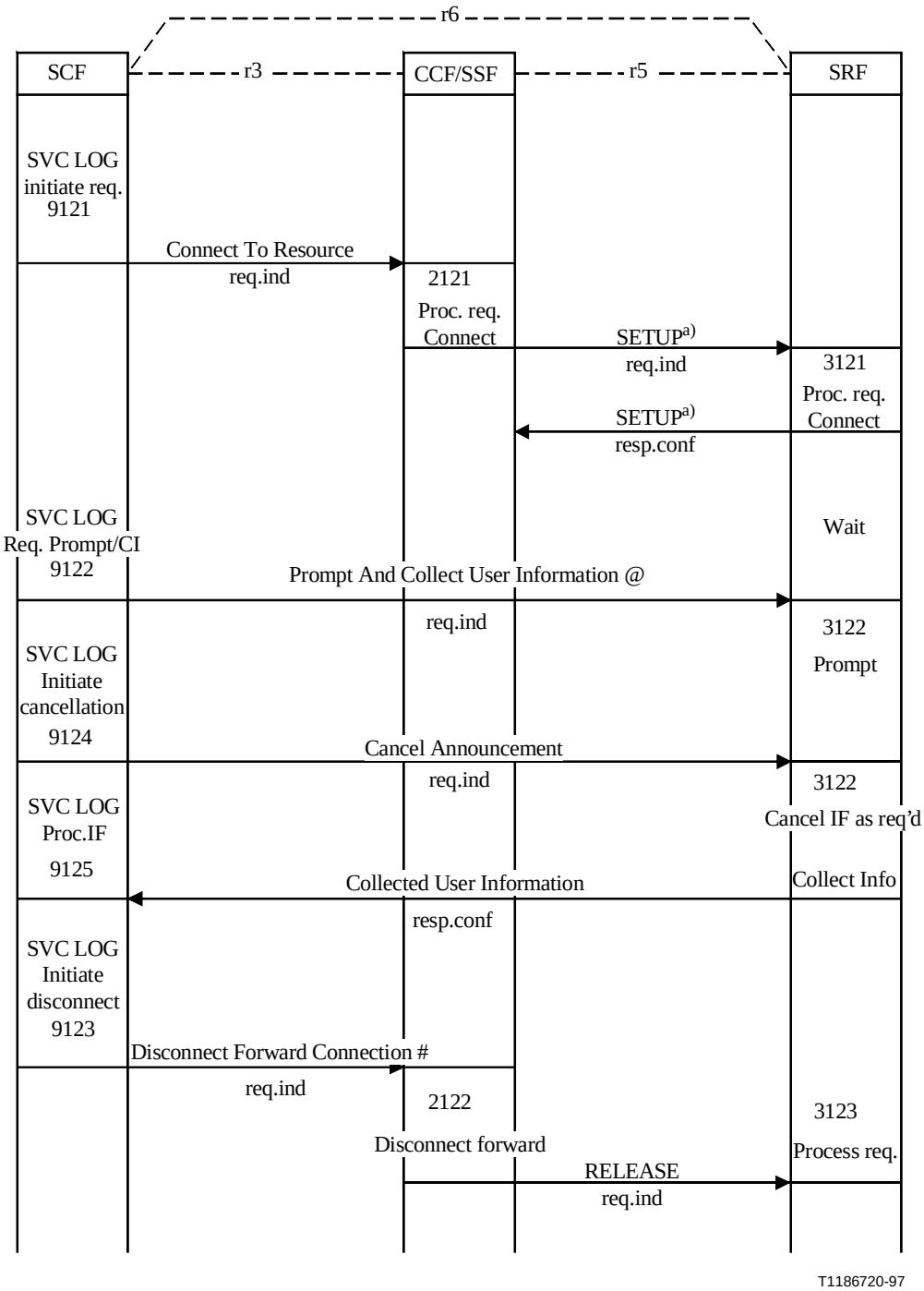
11.2.18.2 Information flow diagrams

Figures 11-79 and 11-80 depict information flows and functional entity actions involved in executing the USER INTERACTION SIB for playing an announcement and/or obtaining additional information from a user over the bearer channel, e.g. 64 kbit/s circuit.

The information flows, functional entity actions and SDL diagrams are shown here only for the case where the SCF-SRF information flows are relayed via the SSF/CCF. The case where there is direct exchange of information flows between the SCF and the SRF is identical with the assist case (see 11.2.18.5).

Figure 11-81 depicts information flows and functional entity actions for the case where user interaction script is used.

Figure 11-82 depicts information flows and functional entity actions for call unrelated user interaction.

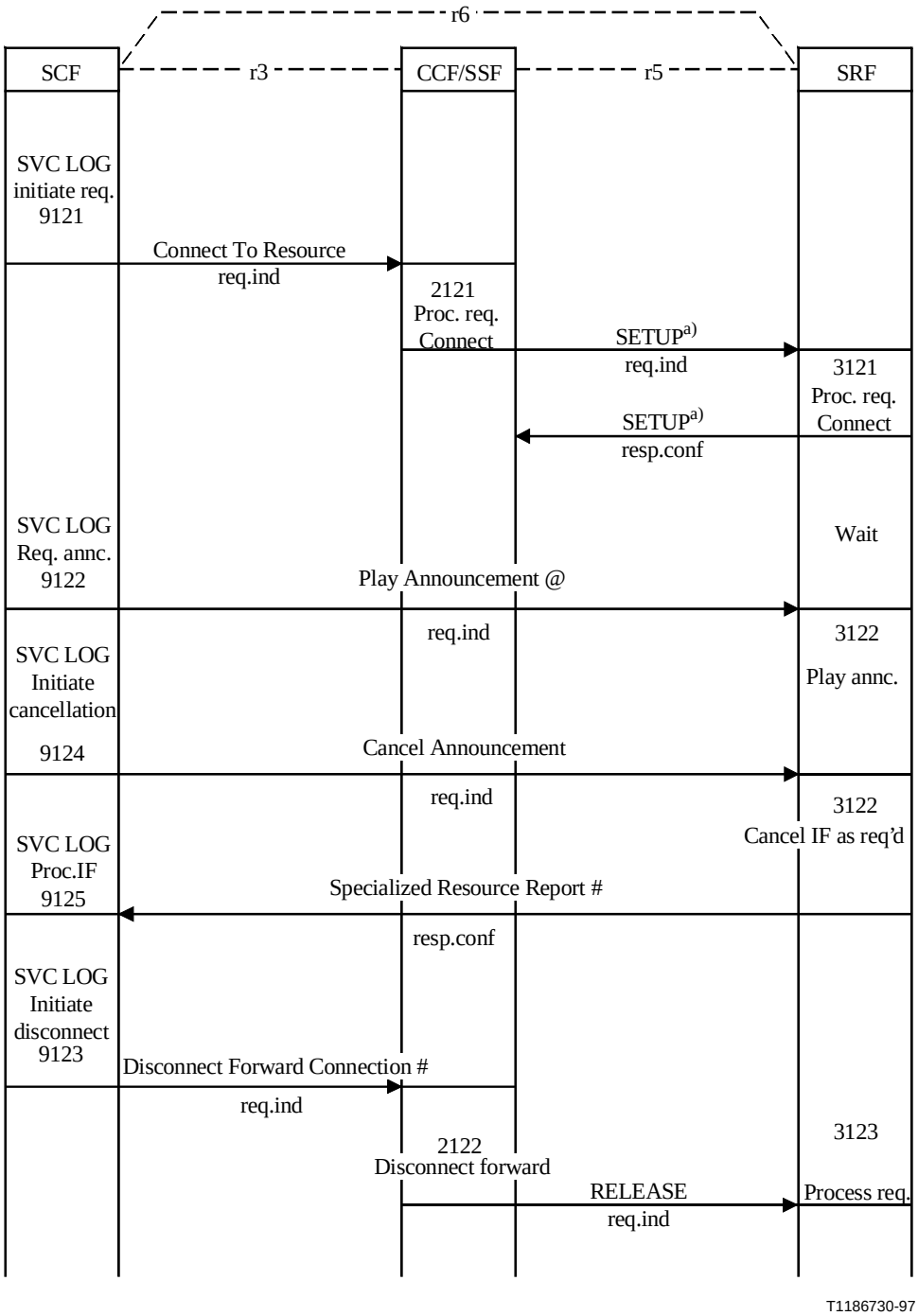


@ Any number of announcement and/or prompt and collect information flows may be sent before the SRF is disconnected.

Optional information flows.

a) Optional information flows (depends on physical configuration).

Figure 11-79/Q.1224 – Information flow diagram USER INTERACTION SIB (as used to collect user information)

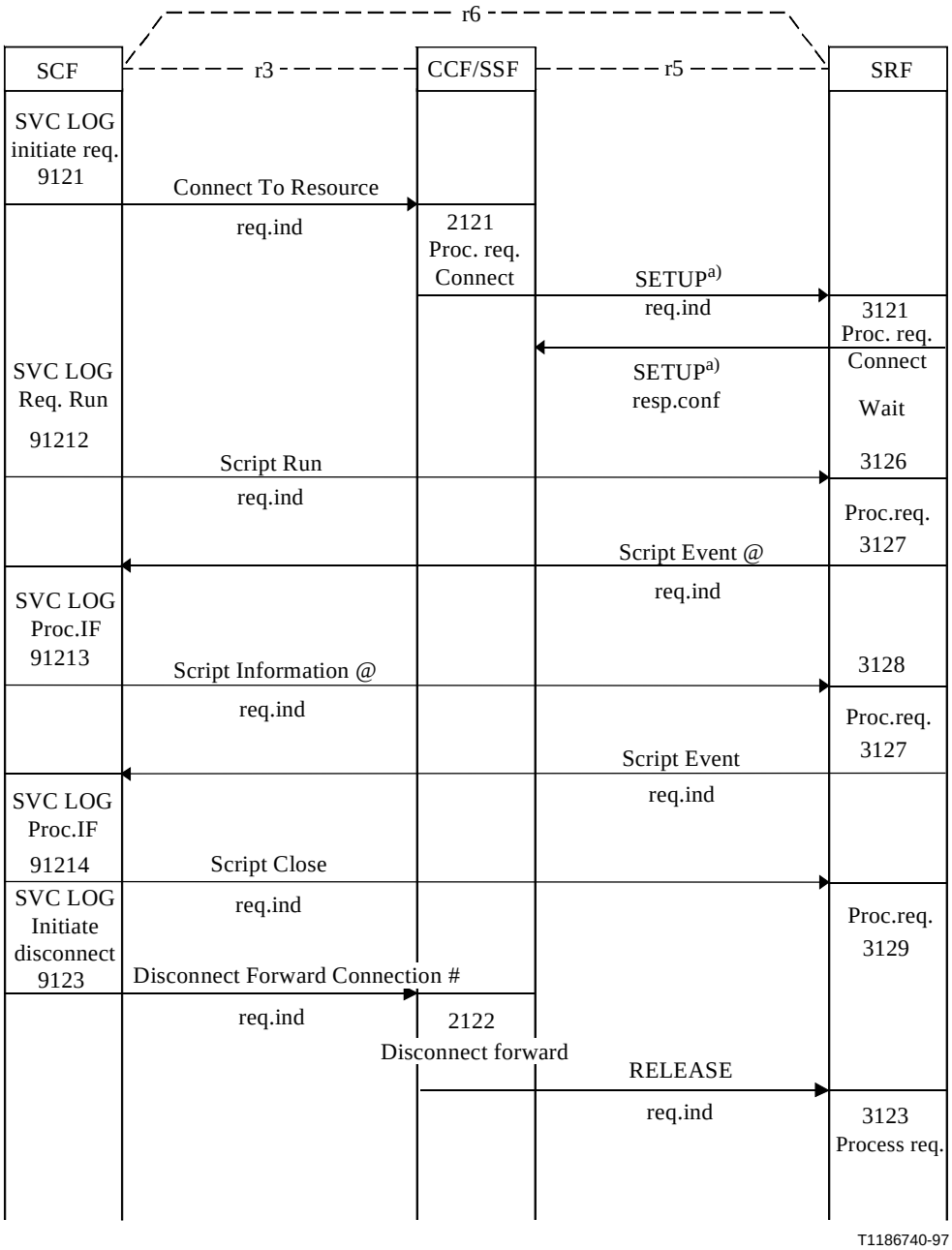


@ Any number of announcement and/or prompt and collect information flows may be sent before the SRF is disconnected.

Optional information flows.

a) Optional information flows (depends on physical configuration).

Figure 11-80/Q.1224 – Information flow diagram USER INTERACTION SIB (as used to play announcement toward user)

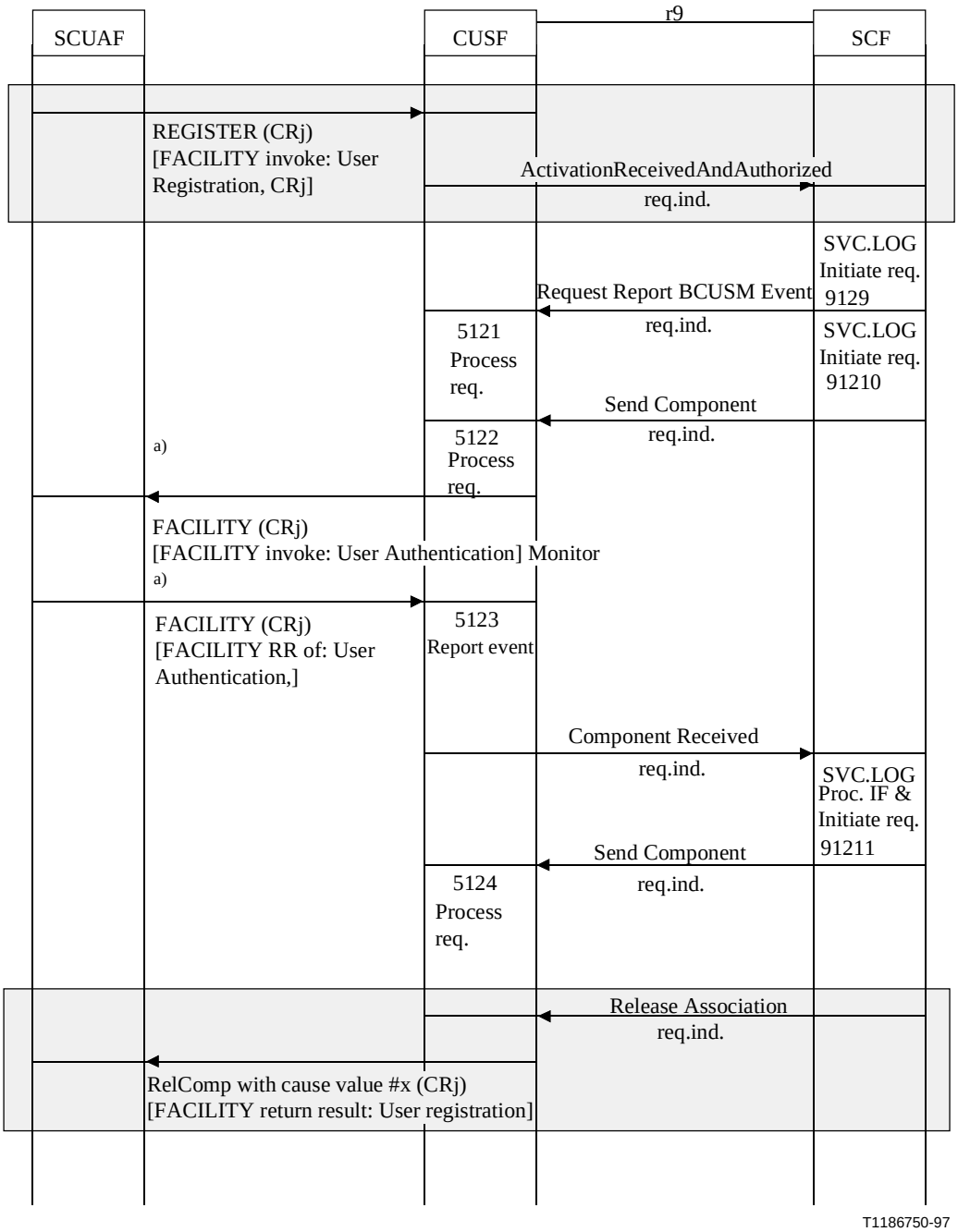


@ Any number of Script Information and/or Script Event information flows may be sent before the SRF is disconnected.

Optional information flows.

a) Optional information flows (depends on physical configuration).

Figure 11-81/Q.1224 – Information flow diagram USER INTERACTION SIB (as used to run user interaction script)



Is outside the UI information flow diagrams, and is for explanatory purposes only.

@ These patterns can be repeated any number of times before the association between the SCUAF and the CUSF is released.

a) Depends on the physical configuration; however, in CS-2 only the DSS 1 is assumed for the underlying layer.

NOTE – This stage 2 assumes CR management will be realized between CUSF and CCF and feature interaction will be realized between CUSF and SSF.

Figure 11-82/Q.1224 – Information flow diagram for USER INTERACTION SIB (as used for call unrelated interaction)

11.2.18.3 SDLs

Figure 11-83 is an SDL that shows the actions at an SCF involved in executing the USER INTERACTION SIB.

Figure 11-84 is an SDL that shows the actions at a CCF/SSF involved in executing the USER INTERACTION SIB.

Figure 11-85 is an SDL that shows the actions at an SRF involved in executing the USER INTERACTION SIB.

Figure 11-86 is an SDL that shows the actions an SCF and CUSF involved in executing the USER INTERACTION SIB for call unrelated interaction.

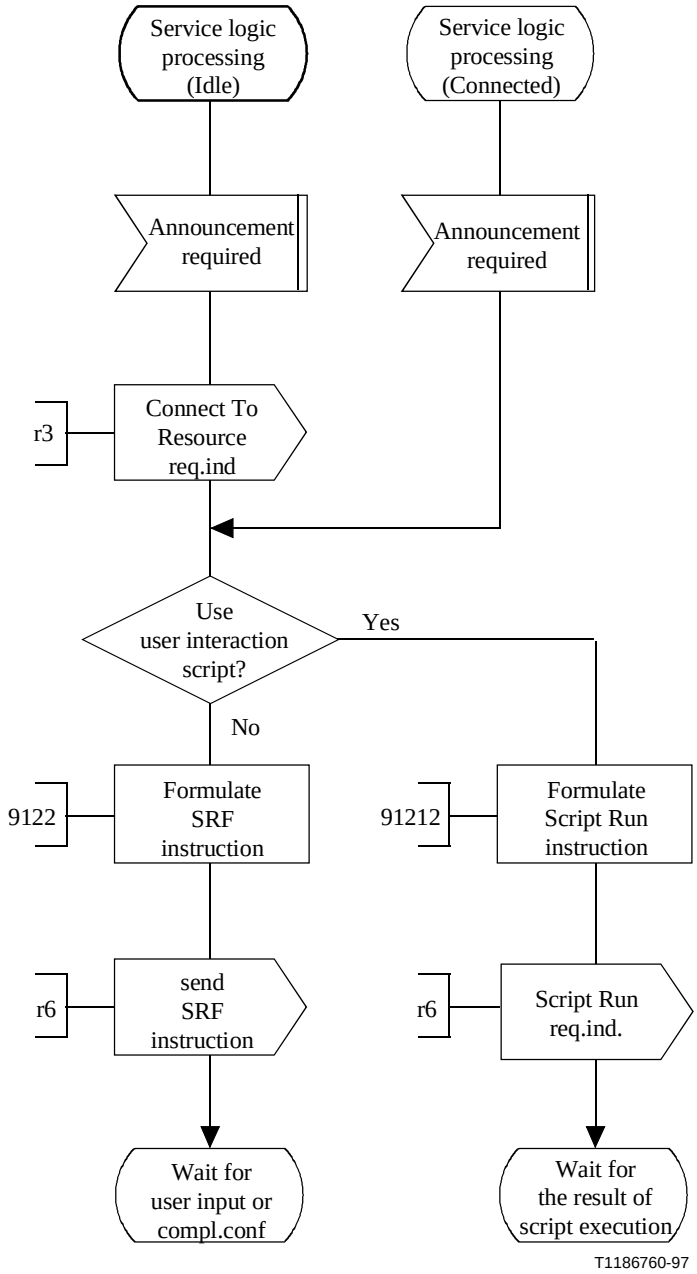
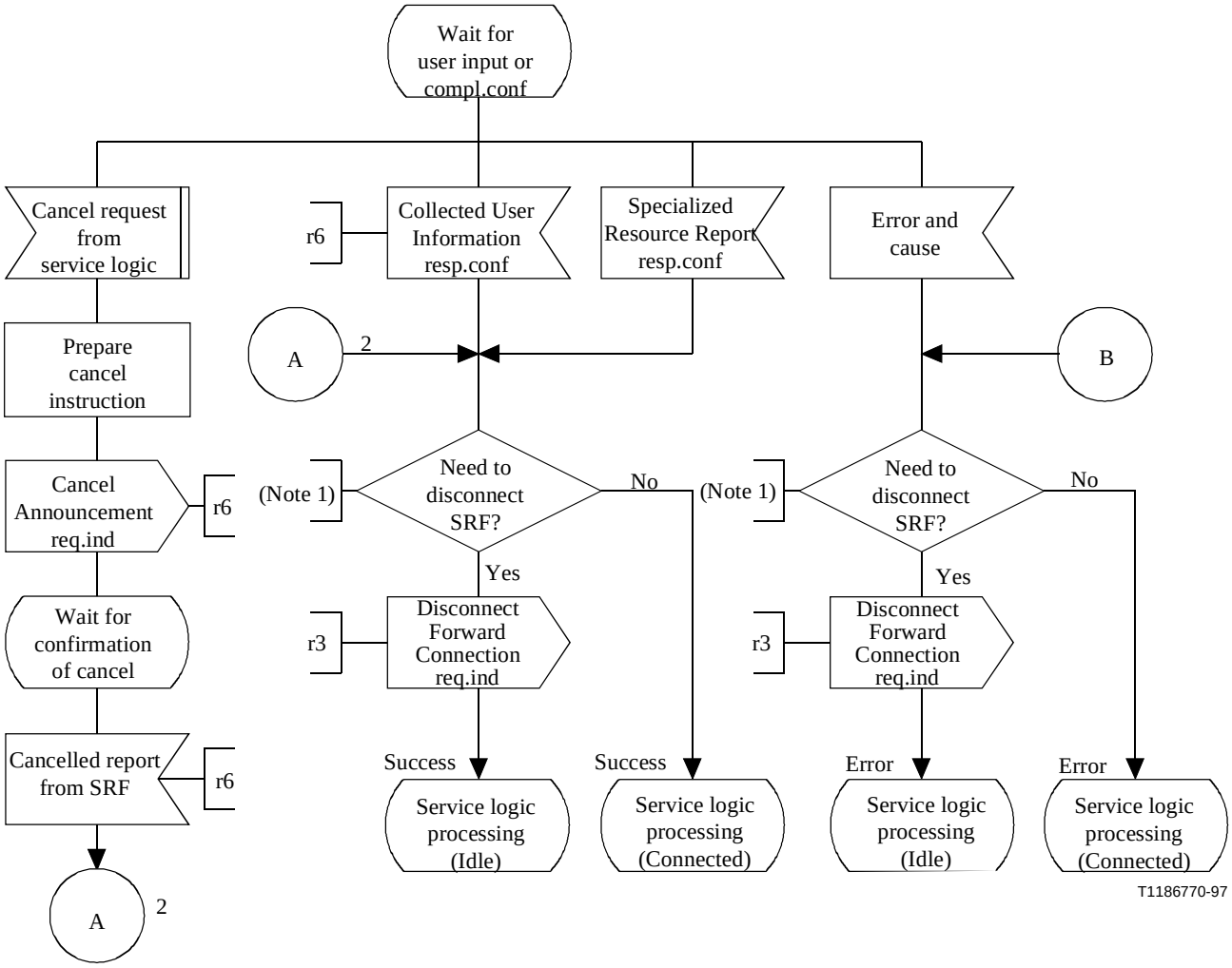


Figure 11-83/Q.1224 (sheet 1 of 3) – SCF actions for USER INTERACTION SIB



NOTE 1 – Uses service logic program knowledge of whether an SRF type or capability has been previously connected and SCF knowledge whether next user interaction requires same or different physical entity to decide on connect/disconnect. This is accomplished through datafill provided to the SCF by the service management system when service logic is deployed and commissioned.

NOTE 2 – The particular SRF to connect to is determined from SCF knowledge of which SRF type or capability is required and whether there is a previous connection to an SRF of that type or capability. This is accomplished through datafill provided to the SSF by the service management system when service logic is deployed and commissioned.

Figure 11-83/Q.1224 (sheet 2 of 3) – SCF actions for USER INTERACTION SIB

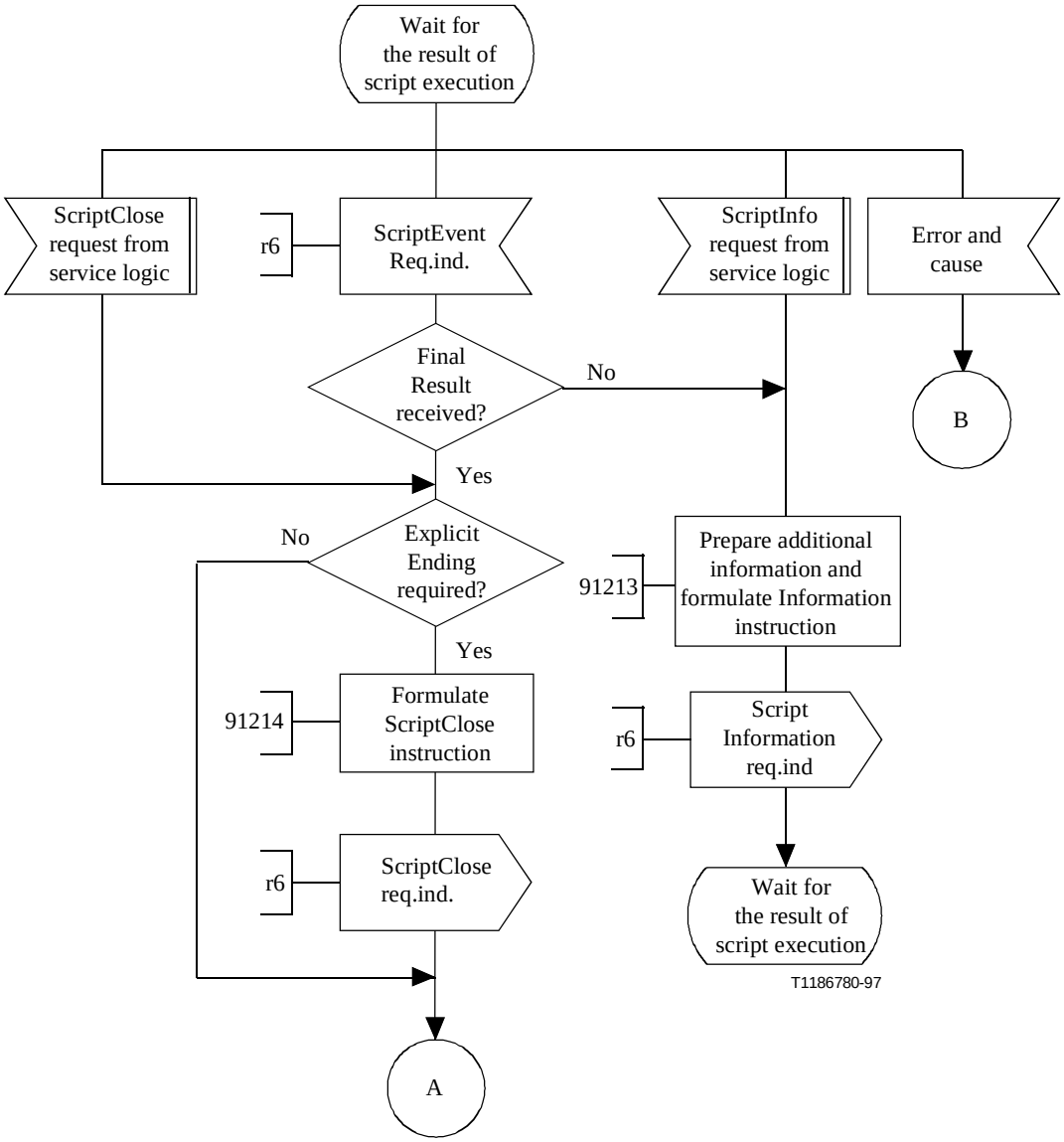


Figure 11-83/Q.1224 (sheet 3 of 3) – SCF actions for USER INTERACTION SIB

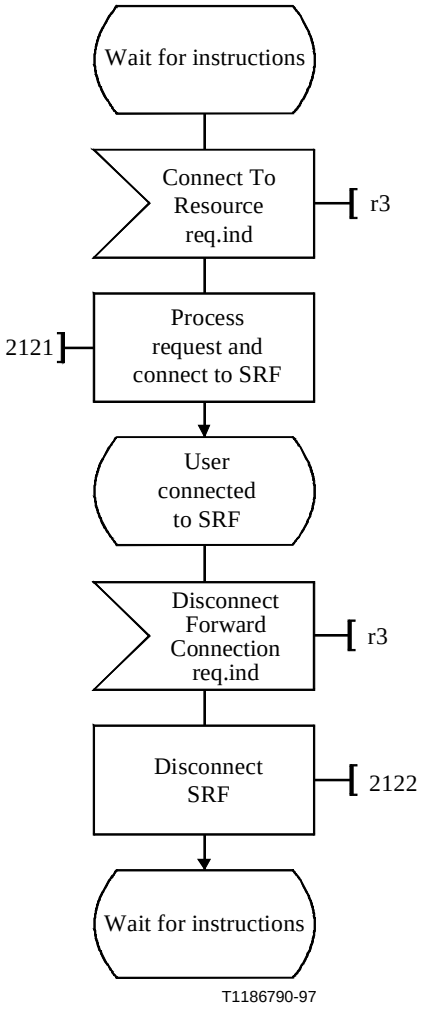


Figure 11-84/Q.1224 – CCF/SSF actions for USER INTERACTION SIB

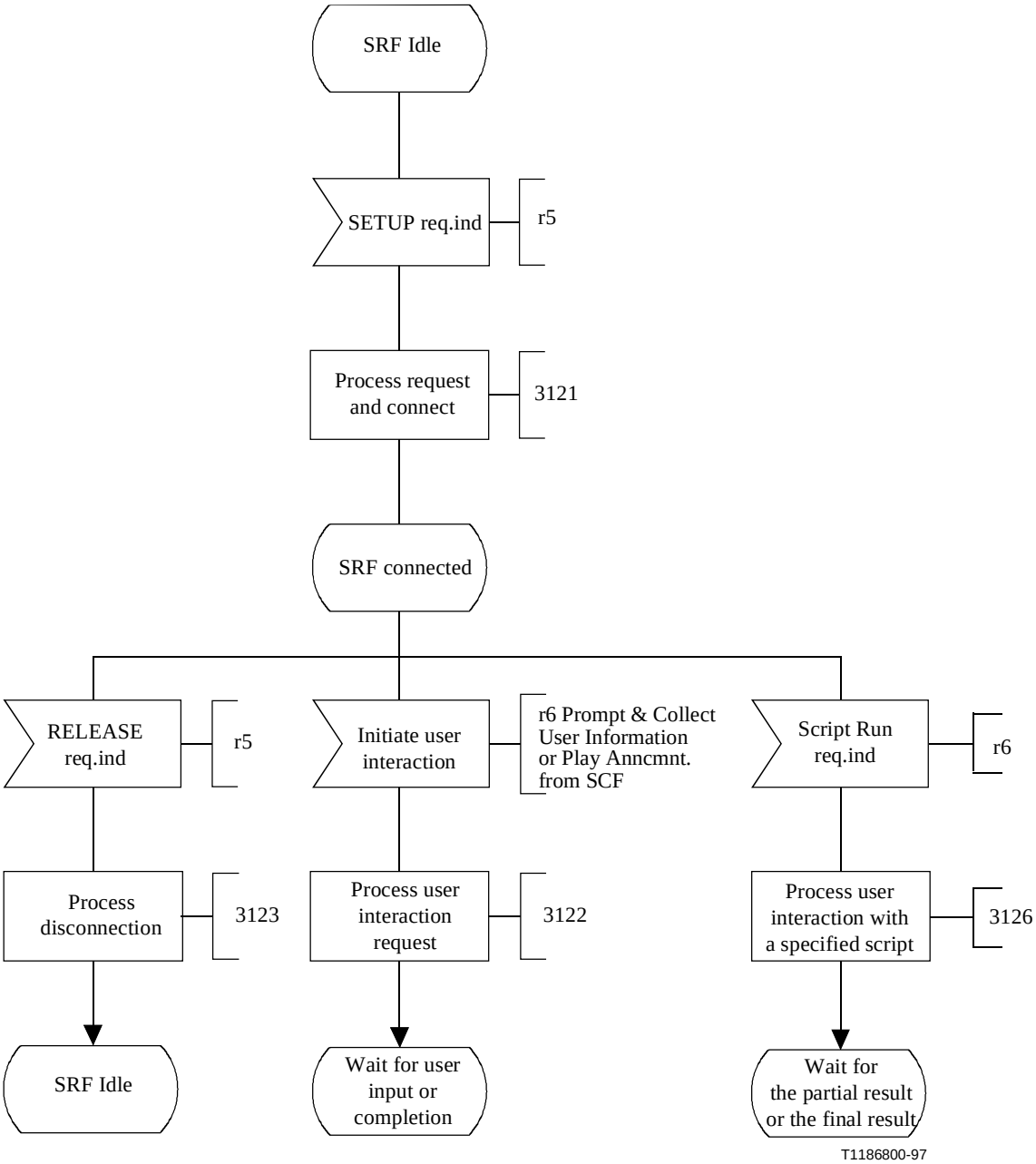


Figure 11-85/Q.1224 (sheet 1 of 4) – SRF actions for USER INTERACTION SIB

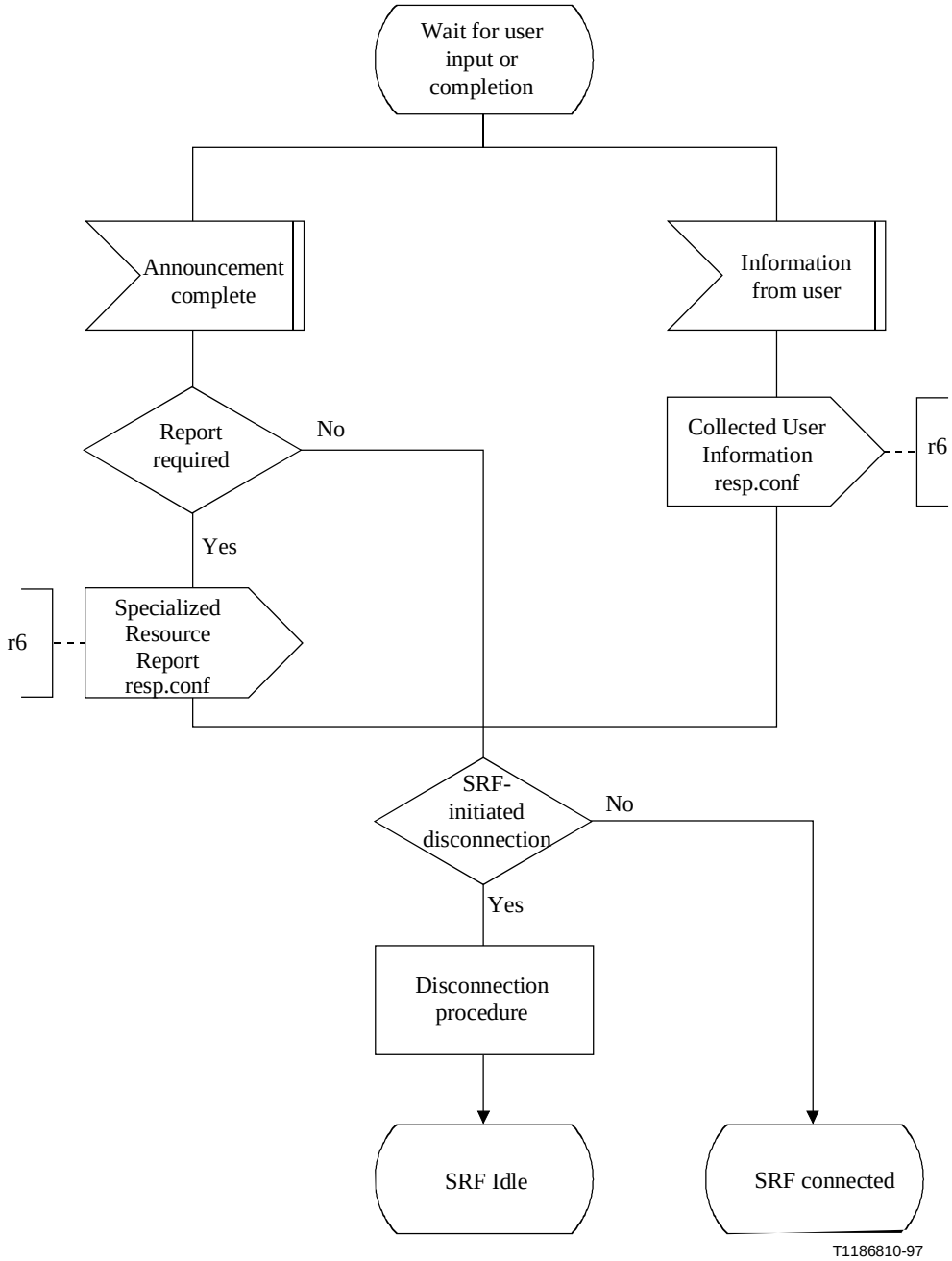


Figure 11-85/Q.1224 (sheet 2 of 4) – SRF actions for USER INTERACTION SIB

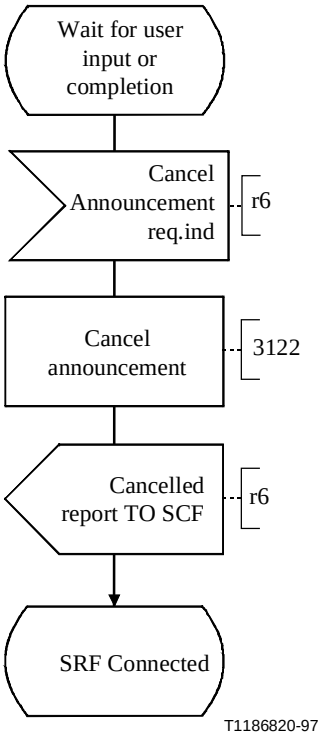


Figure 11-85/Q.1224 (sheet 3 of 4) – SRF actions for USER INTERACTION SIB

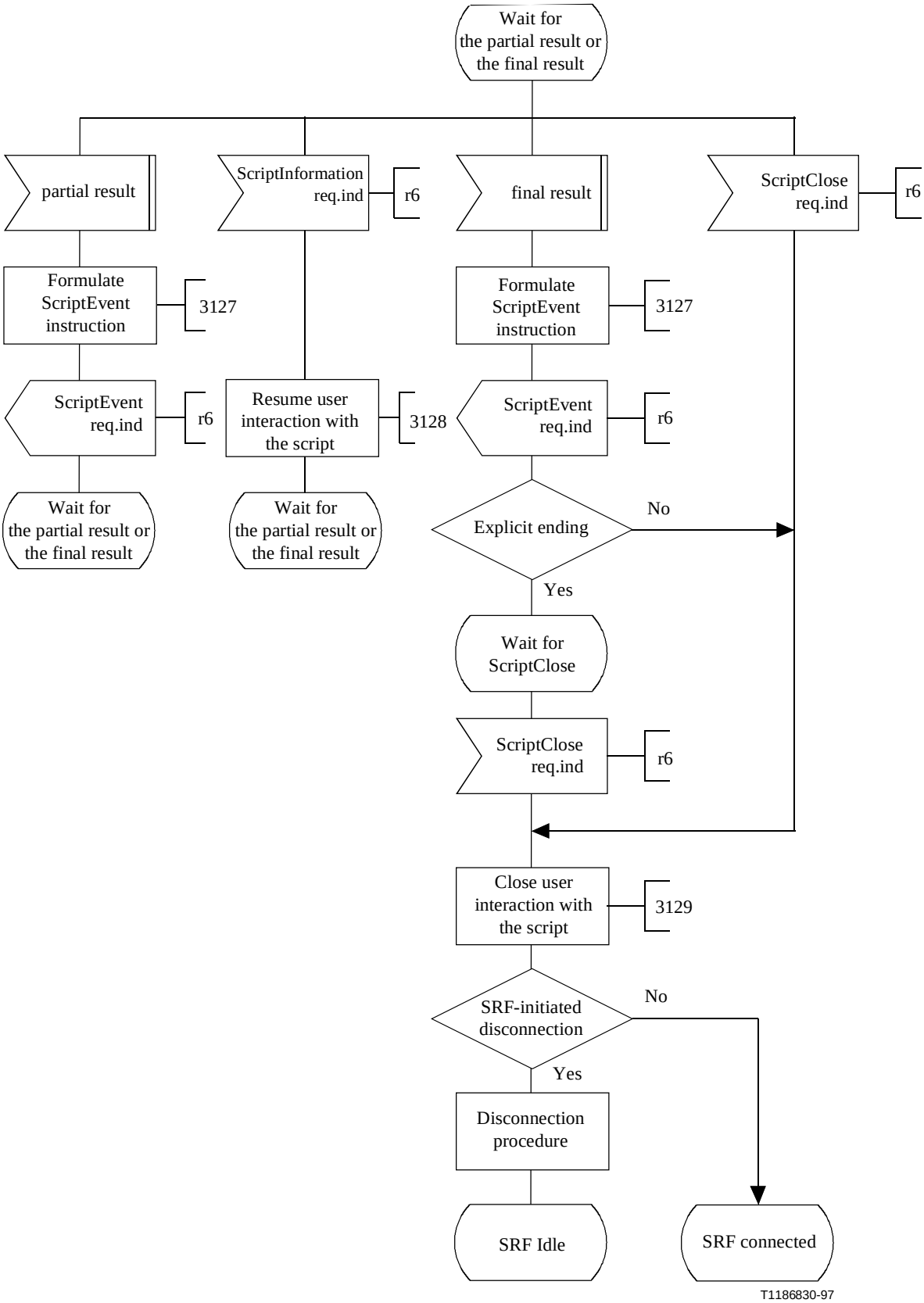


Figure 11-85/Q.1224 (sheet 4 of 4) – SRF actions for USER INTERACTION SIB

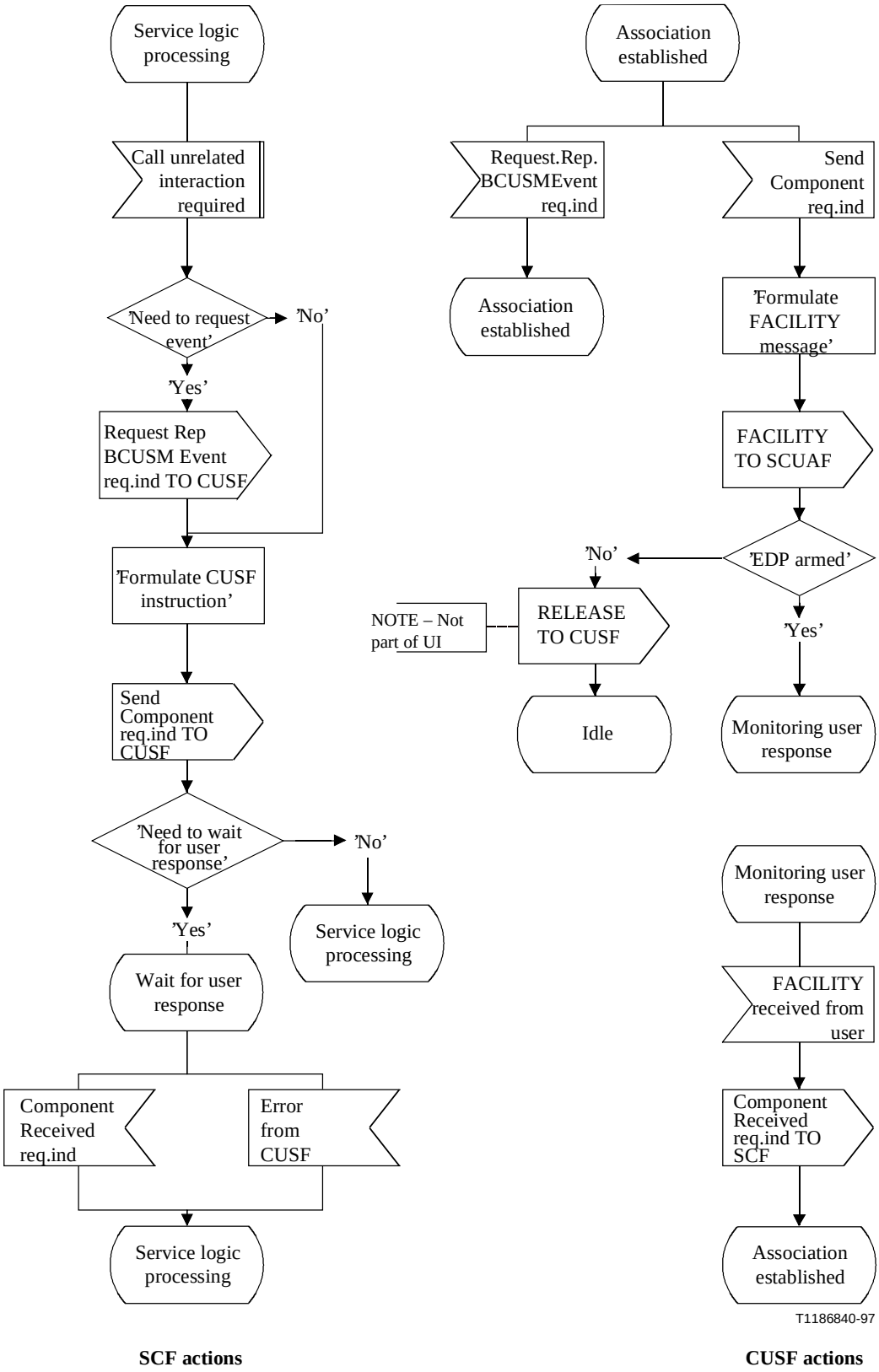


Figure 11-86/Q.1224 – SCF and CUSF actions for USER INTERACTION SIB (call unrelated interaction)

11.2.18.4 Functional entity actions

SCF-related FEAs

Reference number	*Action*
9121	Initiate request – Initiate a Connect To Resource req.ind
9122	Request prompt/collect information or announcement – Initiate a Prompt And Collect User Information or Play Announcement req.ind and send to the SRF
9123	Initiate disconnection of SRF – Initiate a Disconnect Forward Connection req.ind and send to the CCF/SSF
9124	Initiate cancellation of pending prompt/collect information or announcement – Initiate a Cancel Announcement req.ind and send to the SRF
9125	Process result – Receive Specialized Resource Report resp.conf or Collected User Information resp.conf from SRF – Pass to service logic
9129	Initiate request to report a component that will be received from the user – Initiate a Request Report BCUSM Event req.ind.
91210	Initiate request to send a component to the user – Initiate a Send Component req.ind.
91211	Process request – Receive Component Received req.ind. from the CUSF – Analyse information (determine the further interaction will be needed or not, etc.) Initiate request to send a component to the user – Initiate a Send Component req.ind.
91212	Request Script Run (activation of user interaction script) – Initiate a Script Run req.ind and send to the SRF
91213	Process result – Receive Script Event req.ind from SRF. The Script Event contains the partial result of the execution of the user interaction script – Prepare additional information necessary for resuming the execution of the script – Formulate and send Script Information req.ind

91214	Process result – Receive Script Event req.ind from SRF. The Script Event contains the final result of the execution of the user interaction script – Formulate and send Script Close req.ind – Pass the results to service logic

SSF-related FEAs

Reference number	*Action*
2121	Process request – Receive Connect To Resource req.ind from the SCF – Analyse information (call involved, announcement address, routing requirements, etc.) – Formulate and send a SETUP req.ind to the SRF (if required) Connect – Establish communications path between user and specialized resource
2122	Disconnect forward – Receive Disconnect Forward Connection req.ind from the SCF – Formulate and send RELEASE req.ind to SRF

SRF-related FEAs

Reference number	*Action*
3121	Process request – Receive and analyse SETUP req.ind from CCF/SSF – Select appropriate announcement resource Connect – Connect incoming resource to specialized resource
3122	Prompt/play announcement – Receive and analyse Prompt And Collect User Information or Play Announcement req.ind from SCF – Apply prompt/announcement on resource toward user – Return Specialized Resource Report req.ind at conclusion of announcement if requested in Play Announcement req.ind – Disconnect SRF as per Recommendation Q.71 if allowed Collect information – Receive user information – Formulate and send Collected User Information resp.conf to SCF – Disconnect SRF as per Recommendation Q.71 if allowed

	Cancel announcement
	– Receive and analyse Cancel Announcement req.ind
	– Stop playing of announcement if/as required
	– Send cancelled report to SCF (in Collected User Information resp.conf or Specialized Resource Report resp.conf)
3123	Process request
	– Receive and analyse RELEASE req.ind from CCF/SSF
	– Continue disconnection process per Recommendation Q.71
3126	Script Run
	– Receive and analyse Script Run req.ind from SCF
	– Allocate the necessary resources to perform the instance of the User Interaction script
	– Activate the User Interaction script instance
3127	Script Event
	– Formulate and send Script Event req.ind to SCF, when required.
3128	Script Information
	– Receive and analyse Script Information req.ind from SCF
	– Resume the User Interaction script instance
3129	Script Close
	– Receive and analyse Script Close req.ind from SCF
	– Deallocate the resources used to perform the instance of the User Interaction script
	– The context is released

CUSF-related FEAs

Reference number	*Action*
5121	Process request
	– Receive Request Report BCUSM Event req.ind. from the SCF
5122	Process request
	– Receive Send Component req.ind. from the SCF
	– Analyse information (determine the message for delivering the component, etc.)
	– Formulate and send a FACILITY message to the user (if required)
5123	Initiate request to send a Component Received req.ind.
	– Analyse the received information from the end user, and decide if it should be reported or not to the SCF
	– Initiate a Send Component req.ind.

5124	Process request – Receive Send Component req.ind. from the SCF – Analyse information (determine the message for delivering the component, etc.) – Formulate and send a FACILITY message to the user (if required)

11.2.18.5 Service assist capability for user interaction

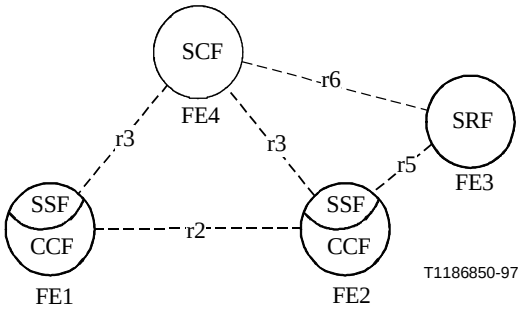
11.2.18.5.1 Description

The service assist procedure is used in cases where an initiating CCF/SSF does not have direct access to a suitable SRF that is required for processing a call/service attempt. The service assist procedure establishes a temporary connection through the network to the SRF. This connection is released at the conclusion of SRF usage and call processing proceeds at the initiating CCF/SSF.

The same information flows, functional entity actions and SDL diagrams apply to the non-assisting case where the SCF and SRF exchange information flows directly.

11.2.18.5.2 Functional model

The FE numbers shown in the functional model (Figure 11-87) are relevant to subclause 11.2.18.5 only. The FE numbers used here do not relate to the FE numbers used in deriving the functional entity action numbers (see 11.1.3).



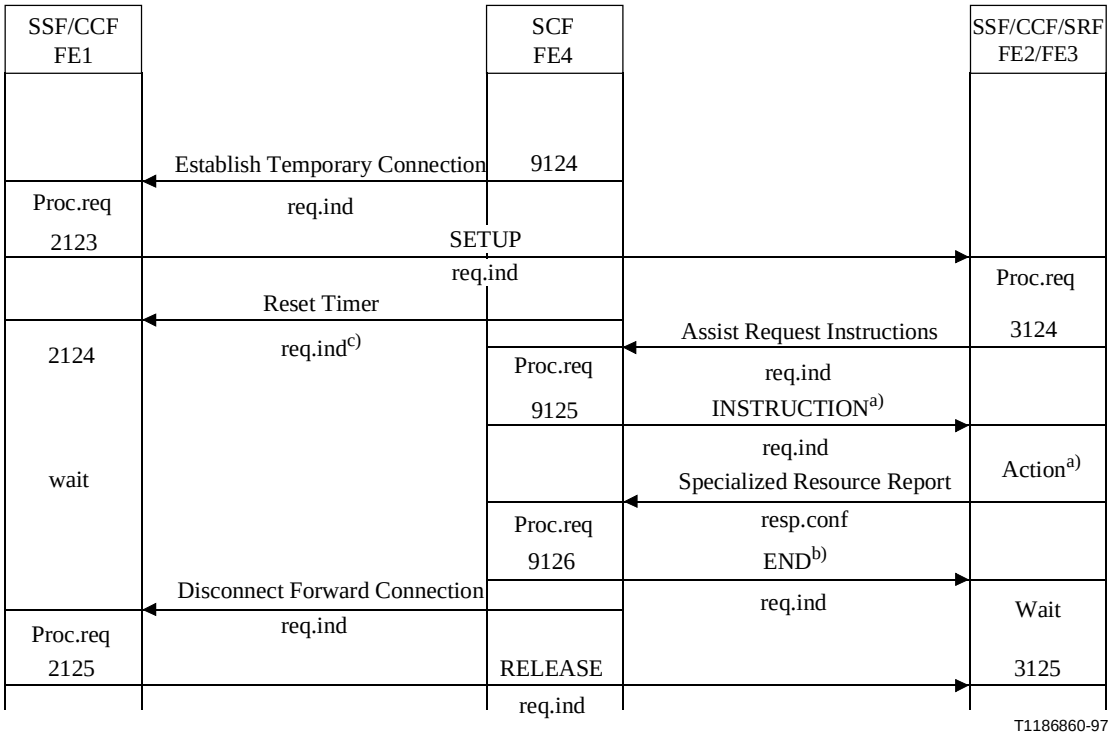
FE1 Is the initiating CCF/SSF. It does not have direct access to the SRF.
FE2 Is an assisting CCF/SSF with direct access to the SRF.
FE3 Is an SRF suitable for use in processing the call attempt.
FE4 Is the SCF that exercises service control for this call/service attempt.

Figure 11-87/Q.1224 – Service assist procedure functional model

11.2.18.5.3 Information flow diagrams

Figure 11-88 shows the information flows and functional entity actions used to exercise the service assist procedure. For the sake of simplicity, FE2 and FE3 (CCF/SSF and SRF) are shown as an integrated entity. If they are separated, the diagram should be expanded to show the required additional information flows per the USER INTERACTION SIB.

Where there is a direct SCF-SRF exchange of information flows, whether in the assisting or non-assisting cases, it is FE3 (SRF) which is interacting with the initiating SSF/CCF and SCF. Where the SSF is relaying the information flows, it is FE2 (assisting SSF/CCF) which is interacting with the initiating SSF/CCF and SCF.



a) For example, Connect to Resource and Prompt and Collect User Information.

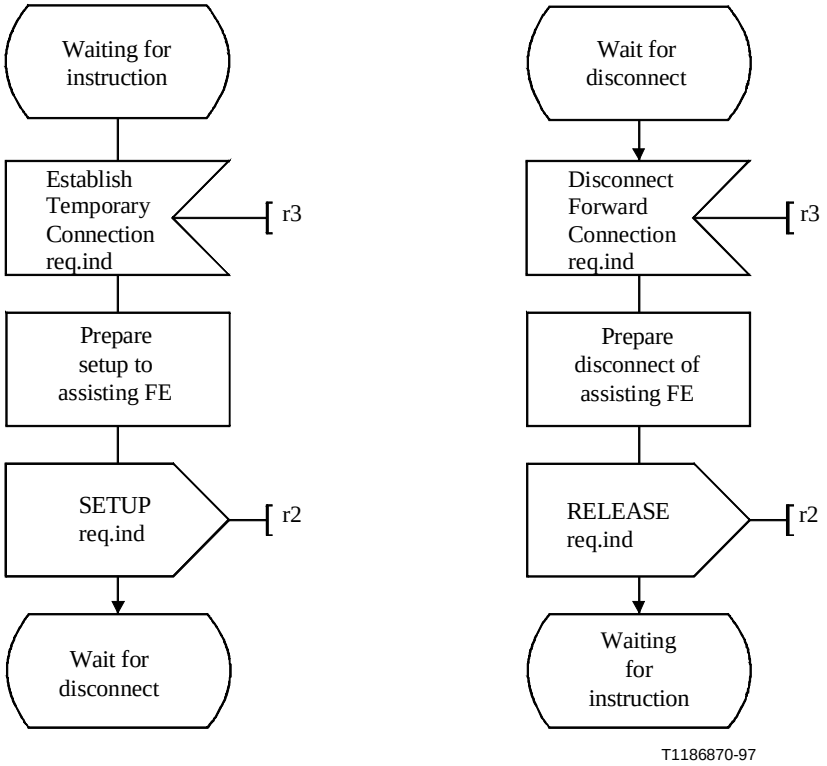
b) May be explicit or pre-arranged end of the FE4-to-FE2/FE3 relationship.

c) Any number of Reset Timer req.ind could be sent from FE4-FE1.

Figure 11-88/Q.1224 – Information flow diagram, service assist procedure

11.2.18.5.4 Service assist SDLs

See Figures 11-89 to 11-91.



NOTE – Reset Timer is not depicted here.

Figure 11-89/Q.1224 – Actions at initiating CCF/SSF (FE1) for service assist procedure

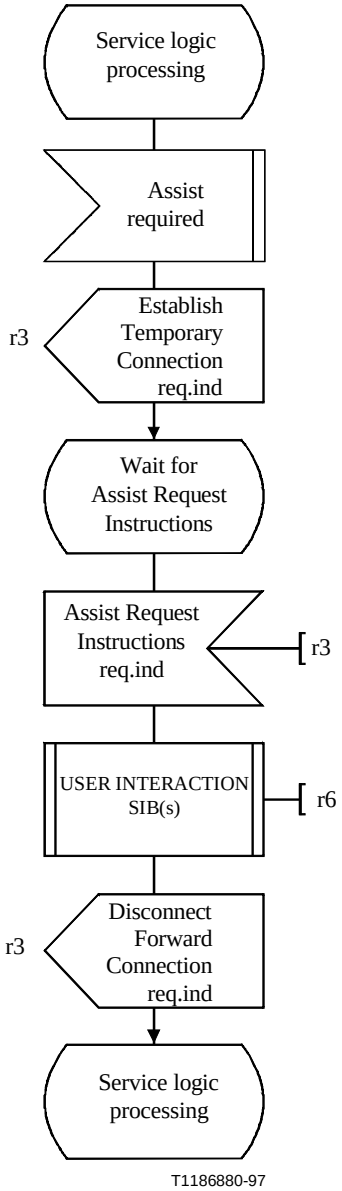


Figure 11-90/Q.1224 – Actions at SCF (FE4) for service assist procedure

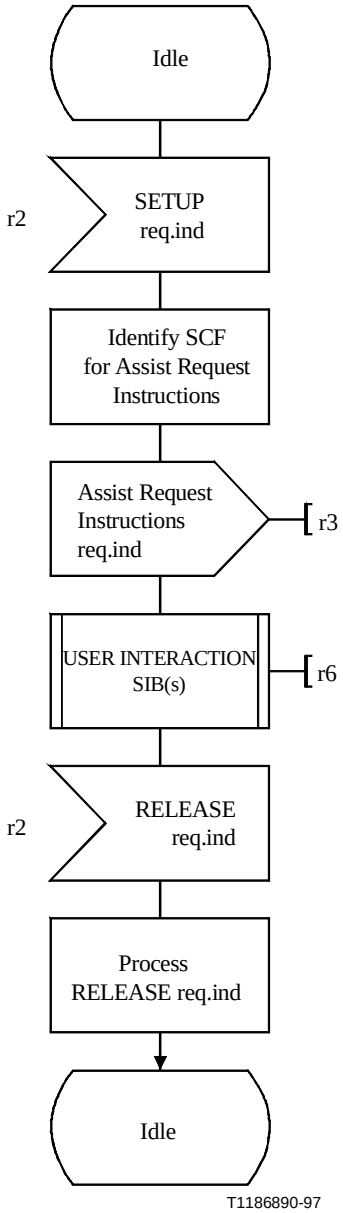


Figure 11-91/Q.1224 – Actions at assisting SSF/SRF (FE2/FE3) for service assist procedure

11.2.18.5.5 Functional entity actions

Only those functional entity actions used to execute service assist or direct SCF-SRF interaction are included here.

SCF-related FEAs

Reference number	*Functional entity actions*
9124	Request temporary connection
	– Send Establish Temporary Connect req.ind to SSF
	– Wait for assisting SSF/SRF

9125	Process assist request instructions – Receive Assist Request Instructions req.ind from assisting SSF – Proceed with user interaction information flows
9126	End assist – Send Disconnect Forward Connection req.ind to initiating SSF – Proceed with instructions to initiating SSF

SSF-related FEAs

Reference number	*Functional entity actions*
2123	Process establish temporary connect request – Receive Establish Temporary Connect req.ind from SCF – Send SETUP req.ind to assisting SSF/SRF – Set a timer with the appropriate time-out value
2124	Reset timer – Update the value of the timer with the value received from SCF
2125	Process forward disconnection – Receive Disconnect Forward Connection req.ind from SCF – Send RELEASE req.ind to the assisting SSF/SRF
2126	Detect assist request – Detect service assist request from initiating SSF – Send Assist Request Instructions req.ind to appropriate SCF – Wait for user interaction instructions from SCF
2127	Receive end assist – Receive RELEASE req.ind from initiating SSF – End service assist procedure

SRF-related FEAs

Reference number	*Functional entity actions*
3124	Detect assist request – Detect service assist request from initiating SSF – Send Assist Request Instructions req.ind to appropriate SCF – Wait for user interaction instructions from SCF
3125	Receive end assist – Receive RELEASE req.ind from initiating SSF – End service assist procedure

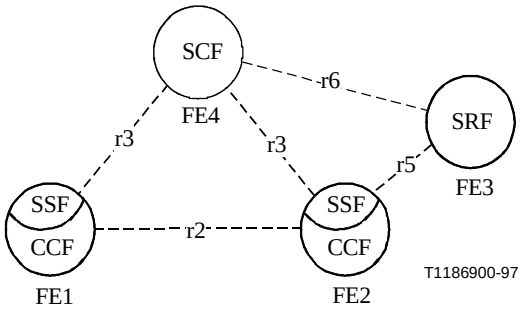
11.2.18.6 Service hand-off capability

11.2.18.6.1 Description

The service hand-off procedure is used where an initiating CCF/SSF does not have direct access to a suitable SRF required for processing a call/service attempt. The service hand-off procedure allows the initiating CCF/SSF to advance the attempt to a CCF/SSF that has direct access to the SRF. At the conclusion of SRF usage, the call attempt is advanced from the latter CCF/SSF.

11.2.18.6.2 Functional model

The FE numbers shown in the functional model (Figure 11-92) are relevant to subclause 11.2.18.6 only. The FE numbers used here do not relate to the FE numbers used in deriving the functional entity action numbers (see 11.1.3).

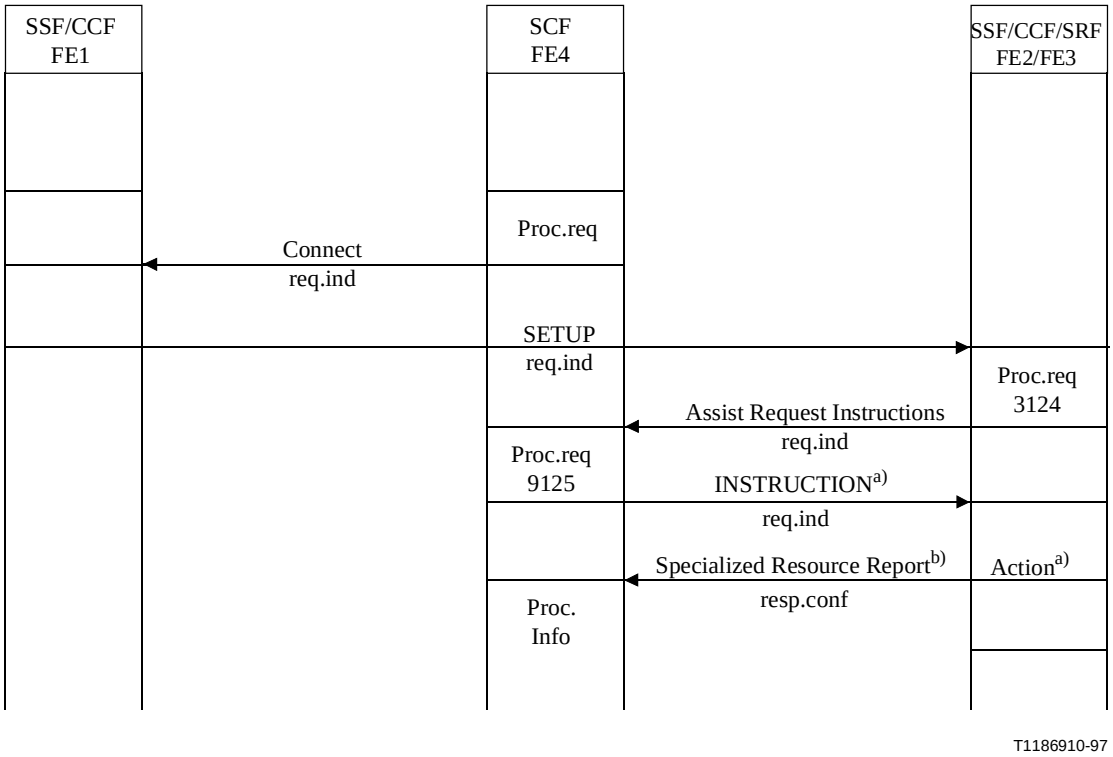


FE1 Is the initiating CCF/SSF. It does not have direct access to the SRF.
FE2 Is an assisting CCF/SSF with direct access to the SRF.
FE3 Is an SRF suitable for use in processing the call attempt.
FE4 Is the SCF that exercises service control for this call/service attempt.

Figure 11-92/Q.1224 – Service hand-off procedure functional model

11.2.18.6.3 Information flow diagrams

Figure 11-93 shows the information flows and functional entity actions used to exercise the service hand-off procedure. For the sake of simplicity, FE2 and FE3 (CCF/SSF and SRF) are shown as an integrated entity. If they are separated, the diagram should be expanded to show the required additional information flows per the USER INTERACTION SIB.



a) For example, connect to Resource and Prompt and Collect User Information.

b) Only illustrative. See 11.2.18.2 for details.

Figure 11-93/Q.1224 – Information flow diagram, service hand-off procedure

11.2.18.6.4 Service hand-off SDLs

See Figures 11-94, 11-95 and 11-96.

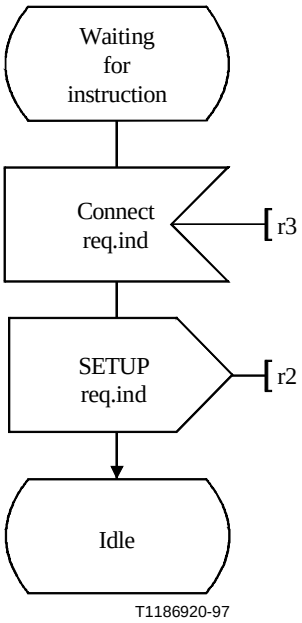


Figure 11-94/Q.1224 – Actions at initiating CCF/SSF (FE1) for service hand-off procedure

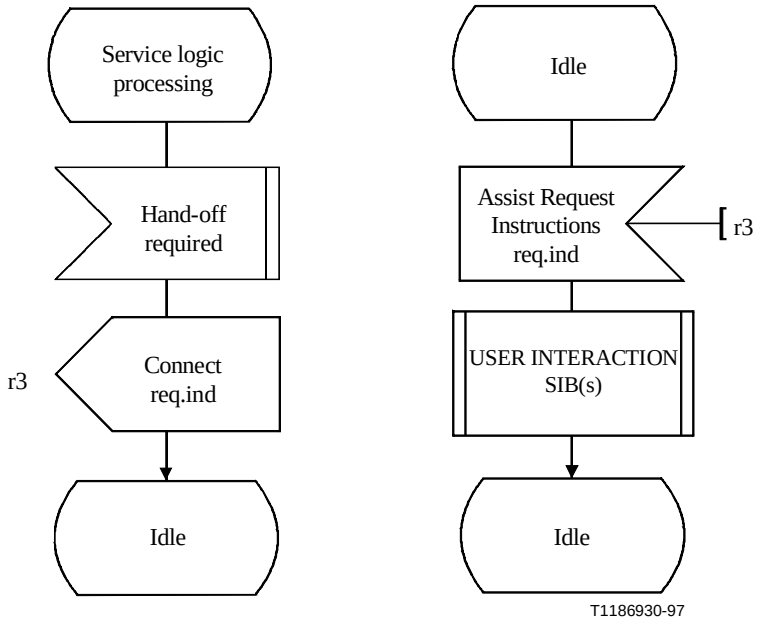


Figure 11-95/Q.1224 – Actions at SCF (FE4) for service hand-off procedure

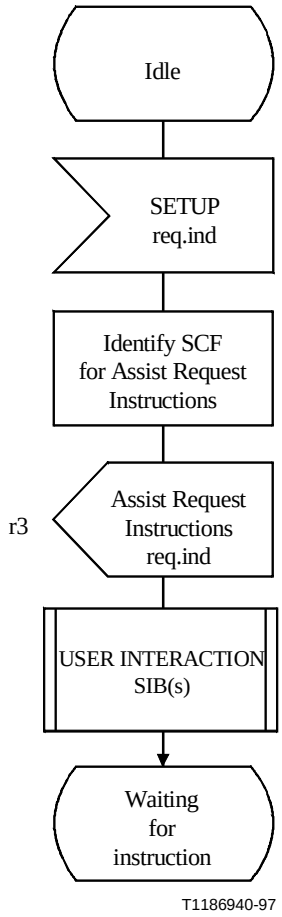


Figure 11-96/Q.1224 – Actions at hand-off SSF/SRF (FE2/FE3) for service hand-off procedure

11.2.18.6.5 Functional entity actions

Since functional entity actions used to execute the service hand-off procedures are described in other subclauses of this Recommendation, information about these FEAs is not replicated here.

11.2.19 VERIFY SIB

11.2.19.1 Description

The VERIFY SIB provides the capability to confirm that information received is syntactically consistent with the expected form of such information. This capability is provided, for IN CS-2, in the SCF as a part of the service logic for IN service features. As a result no information flows are directly associated with this capability.

11.2.19.2 Information flow diagrams

No IFs are required for this SIB in IN CS-2.

11.2.19.3 SDLs

Figure 11-97 presents the SDL diagram for the SCF processing of the VERIFY SIB.

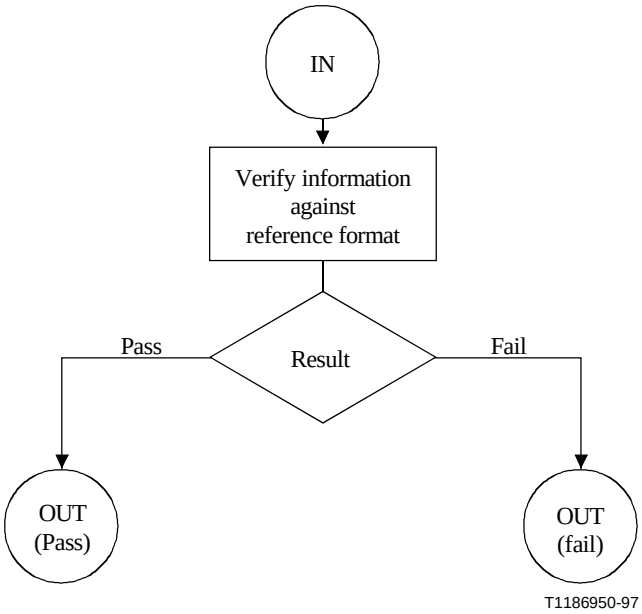


Figure 11-97/Q.1224 – SCF actions for VERIFY SIB

11.2.19.4 Functional entity actions

SCF-related FEA

Reference number	*Action*
9131	Perform verify

11.3 BASIC PROCESS SIBs

11.3.1 BASIC CALL PROCESS SIB

11.3.1.1 Description

The BASIC CALL PROCESS (BCP) SIB provides the SCF with access to SSF/CCF call processing capabilities. For IN CS-2, these capabilities include:

– *Call setup capabilities*: Capabilities to influence originating or terminating call setup for two-party calls (e.g. for flexible routing, call queuing, call diversion).

– *Call party handling*: Capabilities to enable handling of individual call parties (e.g. to hold/retrieve parties in a call or add/drop parties from a call). Note that call party handling capabilities are not considered part of the basic call as defined by Recommendation Q.71.

– *Call initiation*: Capabilities to initiate calls between two parties.

– *Call clearing*: Capabilities to release calls.

– *Event reporting*: Capabilities to request the reporting of call processing events (e.g. caller abandon, busy, or no answer) within the context of existing calls by setting Event Detection Points (EDPs).

These capabilities enable the use of other SIBs to provide the desired service capabilities for IN CS 2 (e.g. flexible charging, screening, translation, call party interaction, queuing, etc.).

The SSF/CCF or the SCF can invoke BCP capabilities:

– The SSF/CCF invokes BCP capabilities when it detects a Trigger Detection Point (TDP) during basic call processing that leads to sending to the SCF an Initial DP information flow or one of the family of DP-specific initial information flows (both of these are referred to as "initial information flows"). For a TDP-Request, these information flows establish a control relationship between the SSF/CCF and the SCF, enabling the SCF to return instructions to the SSF/CCF. For a TDP-Notification, these information flows do not establish a control relationship.

– The SCF invokes BCP capabilities when it sends an Initiate Call Attempt information flow to the SSF/CCF outside the context of an existing control relationship (i.e. "out-of-the-blue"). This information flow may or may not establish a new control relationship between the SSF/CCF and the SCF, as dictated by the SCF.

Once a control relationship is established, the SCF can send call processing instructions to the SSF/CCF in the form of one or more information flows (e.g. Connect plus Request Report BCSM Event, as described below). These instructions may directly follow an initial information flow, or may follow a previous call processing instruction. The former is referred to as an "immediate instruction," and the latter as a "subsequent instruction."

In the context of a control relationship, the SCF can also request the SSF/CCF to report subsequent call processing events. It does so via the Request Report BCSM Event information flow, which arms Event Detection Points (EDPs) in call processing. When the SSF/CCF detects an armed EDP, it reports it to the SCF in the Event Report BCSM information flow or one of the family of DP-specific information flows (both of these are referred to as "report information flows"). For an EDP-Request, the SSF/CCF sends the appropriate report information flow, then waits for additional instructions from the SCF; for an EDP-Notification, the SSF/CCF sends the appropriate report information flow, then continues call processing without waiting for additional instructions. Note that the Request Report BCSM Event information flow may be combined with other call processing information flows.

These SSF/CCF-SCF information flow interactions are illustrated in the information flow diagrams in 11.3.1.2.1, and the individual information flows are briefly described in 11.3.1.2.2.

The valid call processing information flows that the SCF can send to the SSF/CCF at a given point in time depend on the context of the call at that time (i.e. the state of the call and call party connections). These information flows can be grouped into those that are valid during two-party call setup and clearing, those that are valid during the active state of a call, and those that are valid for multiparty calls.

11.3.1.2 Information flows

11.3.1.2.1 Diagrams

Figure 11-98 depicts the general information flows and functional entity actions to support BCP capabilities invoked by the SSF/CCF (left-hand column) or by the SCF (right-hand column).

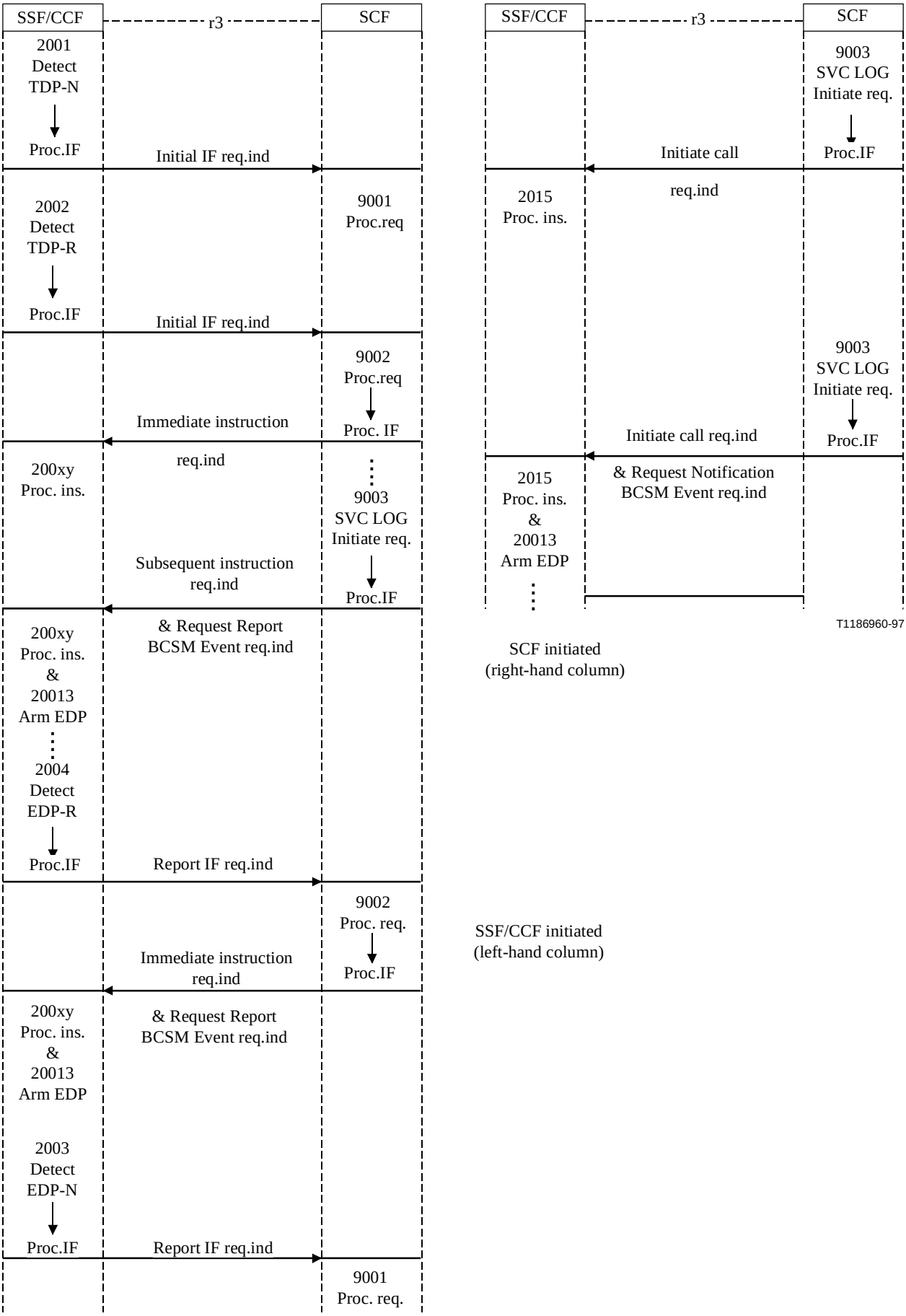


Figure 11-98/Q.1224 – Information flow diagram BASIC CALL PROCESS SIB

11.3.1.2.2 Definition of information flows

This subclause briefly defines the BCP information flows. See clause 11 for detailed information flow and information element descriptions.

1) *Initial and report information flows*

   a) Initial DP req.ind – Information flow from the SSF to the SCF to request instructions from the SCF. The SSF generates it when a trigger is detected at any DP in the BCSM.

   b) DP-specific initial information flow family – Family of information flows from the SSF to the SCF to request instructions from the SCF. This family is an alternative to the Initial DP req.ind. When a trigger is detected at a specific DP in the BCSM, the SSF generates the corresponding DP-specific initial information flow. The specific BCSM DP is reflected in the corresponding information flow name.

      – Origination_Attempt req.ind;
      – Origination Attempt Authorized req.ind;
      – Collected Information req.ind;
      – Analysed Information req.ind;
      – Route Select Failure req.ind;
      – O_Called_Party_Busy req.ind;
      – O_No_Answer req.ind;
      – O_Answer req.ind;
      – O_MidCall req.ind;
      – O_Suspended req.ind;
      – O_Re-answer req.ind;
      – O_Disconnect req.ind;
      – O_Abandon req.ind;
      – Termination Attempt req.ind;
      – Term Attempt Authorized req.ind;
      – Facility Selected And Available req.ind;
      – T_No_Answer req.ind;
      – T_Answer req.ind;
      – T_MidCall req.ind;
      – T_Suspended req.ind;
      – T_Re-answer req.ind;
      – T_Disconnect req.ind;

   c) Event Report BCSM req.ind – Information flow from the SSF to the SCF to notify the SCF that an armed EDP was encountered, as previously requested by the SCF in a Request Report BCSM Event information flow. For an EDP-R, this information flow serves to request instructions from the SCF within the context of an existing control relationship.

   d) DP-specific report information flow family – Family of information flows from the SSF to the SCF to notify the SCF that an armed EDP was encountered, as previously requested by the SCF in a Request Report BCSM Event information flow. This family is an alternative to the Event Report BCSM req.ind. The DP-specific initial information flow family is used for both initial and report information flows.

2) *Call setup and clearing*

a) Connect req.ind (route to a destination) – Information flow from the SCF to the SSF during the call setup phase to complete a call to a defined destination, or to forward a call to another destination.

b) Proceed with call processing family – Family of information flows from the SCF to the SSF to resume call processing at a specific Point in Call (PIC) of the BCSM. The specific BCSM PIC is reflected in the name of the corresponding information flow. These information flows are valid when the SSF has suspended call processing at specific DPs, as identified for each information flow.

- Collect Information req.ind: This information flow is valid when call processing is suspended at one of the following DPs:
  - Origination_Attempt_Authorized;
  - Collected_Info;
  - Analysed_Info;
  - Route_Select_Failure;
  - O_Called_Party_Busy;
  - O_No_Answer;
  - O_Disconnect (called party disconnect only).
- Analyse Information req.ind: This information flow is valid when call processing is suspended at one of the following DPs:
  - Origination_Attempt_Authorized;
  - Collected_Info;
  - Analysed_Info;
  - Route_Select_Failure;
  - O_Called_Party_Busy;
  - O_No_Answer;
  - O_Disconnect (called party disconnect only).
- Select Route req.ind: This information flow is valid when call processing is suspended at one of the following DPs:
  - Origination_Attempt_Authorized;
  - Collected_Info;
  - Analysed_Info;
  - Route_Select_Failure;
  - O_Called_Party_Busy;
  - O_No_Answer;
  - O_Disconnect (called party disconnect only).
- Authorize Termination req.ind: This information flow is valid when call processing is suspended at one of the following DPs:
  - Termination_Attempt;
  - Termination_Attempt_Authorized;
  - T_Busy;
  - T_No_Answer.

– Select Facility req.ind: This information flow is valid when call processing is suspended at one of the following DPs:
  - Termination_Attempt_Authorized;
  - T_Busy;
  - T_No_Answer.

c) Continue req.ind – Information flow from the SCF to the SSF requesting the SSF to resume call processing from the DP at which the SSF previously suspended call processing to await SCF instructions.

d) Release Call req.ind – Information flow from the SCF to the SSF to release a call during any phase of call processing.

e) Reset Timer req.ind – Information flow from the SCF to the SSF to refresh an application timer in the SSF set by a previous information flow.

3) *Call party handling*

a) Analyse Information req.ind – Information flow from the SCF to the SSF requesting the SSF to perform the originating basic call processing actions to analyse destination information.

b) Connect req.ind – Information flow from the SCF to the SSF during the call setup phase to complete a defined destination, or to forward a call to another destination.

c) Continue req.ind – Information flow from the SCF to the SSF requesting the SSF to resume call processing from the DP at which the SSF previously suspended call processing to await SCF instruction.

d) Create Call Segment Association req.ind – Information flow from the SCF to the SSF requesting the SSF to create a new CSA.

e) Disconnect Leg req.ind – Information flow from the SCF to release a specific leg associated with the call and retain any other legs.

f) Entity Released req.ind – Information flow from the SSF to the SCF to inform the SCF about release of an entity (CS, BCSM) caused by exception errors.

g) Initiate Call Attempt req.ind – Information flow from the SCF to the SSF to create a new to one call party using address information provided by the SCF.

h) Merge Call Segments req.ind – Information flow from the SCF to the SSF to merge two associated CSs with a single controlling leg into one CS with that controlling leg.

i) Move Leg req.ind – Information flow from the SCF to the SSF to move leg from one CS to another CS with which it is associated.

j) Move Call Segments req.ind – Information flow from the SCF to the SSF requesting the SSF/CCF to move two call segments together into a single call segment.

k) Reconnect req.ind – Information flow from the SCF to the SSF to re-establish communication between the controlling leg and the passive leg(s) of a call with two or more parties.

l) Release Call req.ind – Information flow from the SCF to the SSF

m) Split Leg req.ind – Information flow from the SCF to the SSF to put a call party on hold.

n) Select Route req.ind – Information flow from the SCF to the SSF requesting the SSF to perform the originating basic call processing actions to determine routing information and select a route for a call.

4) *Call Initiation*

Initiate Call Attempt req.ind – Confirmed information flow from the SCF to the SSF to create a new call to one or more call parties (e.g. wake-up call, predefined conference call).

5) *Event Reporting*

Request Report BCSM Event req.ind – Information flow from the SCF to the SSF to request the reporting of call-related events, then send a report back to the SCF when the requested events are detected [see item 1)]. The SSF monitors events by arming Event Detection Points (EDPs) in the corresponding BCSM(s).

11.3.1.3 SDLs

The following SDL diagrams, (Figure 11-99), are for the SSF/CCF processing of the BASIC CALL PROCESS SIB functionality for TDP-Rs. SDLs for TDP-Ns, SCF processing, and error processing are not for standardization in IN CS-2.

There are three categories of diagrams: processing for two-party call setup and clearing, for two-party and multiparty active calls, and for a pair of associated calls. This subclause provides information flow SDLs for the processing for two-party call setup and clearing.

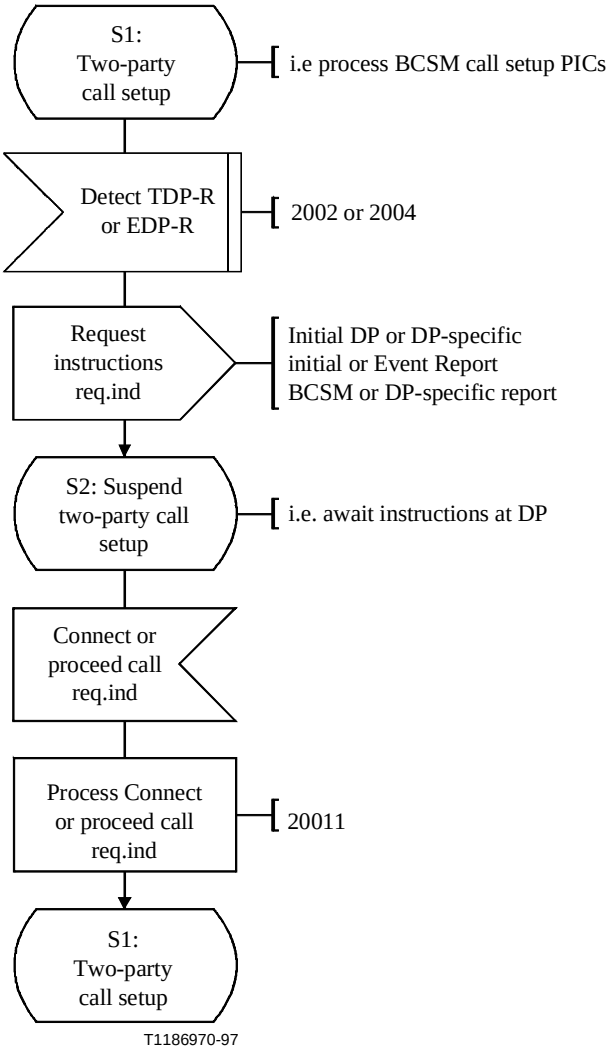
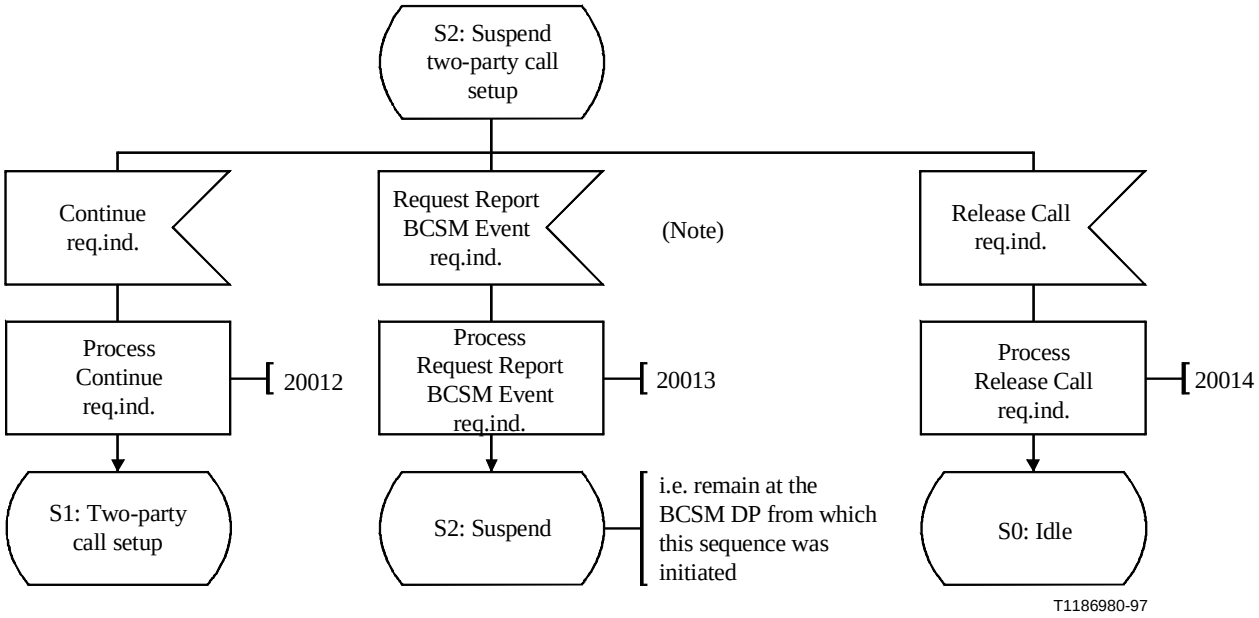


Figure 11-99/Q.1224 (sheet 1 of 3) – CCF/SSF actions for BASIC CALL PROCESS SIB (two-party call setup)



NOTE – The Request Report BCSM Event req.ind should be processed before any instruction to proceed with call-processing in this SDL.

Figure 11-99/Q.1224 (sheet 2 of 3) – CCF/SSF actions for BASIC CALL PROCESS SIB (continuation of call setup)

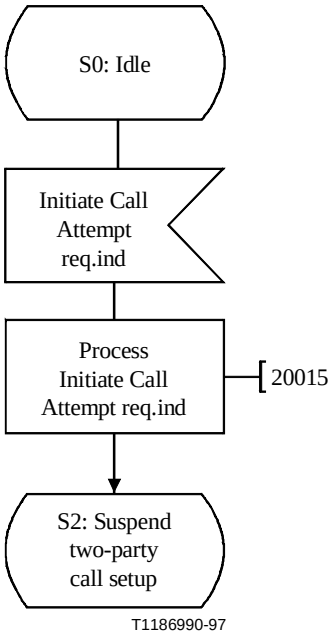


Figure 11-99/Q.1224 (sheet 3 of 3) – CCF/SSF actions for BASIC CALL PROCESS SIB (call initiation)

11.3.1.4 Functional entity actions

SCF-related FEAs

Reference number	*Action*
9001	Process request
	– Process initial information flow (e.g. Initial DP or DP-specific)
9002	Process request requiring response
	– Process initial or report information flow (e.g. Initial DP, DP-specific, or Event Report BCSM)
9003	Initiate request
	– Send one or more BCP information flows
9004	Send response to request
	– Send one or more BCP information flows in response to request

SSF-related FEAs

Reference number	*Action*
2001	Detect trigger detection point-notification
	– Send Initial DP or DP-specific initial req.ind
2002	Detect trigger detection point-request
	– Send initial DP or DP-specific initial req.ind and suspend call processing
2003	Detect event detection point-notification
	– Send Event Report BCSM or DP-specific report req.ind
2004	Detect event detection point-request
	– Send Event Report BCSM or DP-specific report req.ind and suspend call processing
200xy	Process one or more BCP information flows from SCF
20011	Process Connect or proceed with call processing req.ind
20012	Process Continue req.ind
20013	Process Request Report BCSM Event req.ind
	– Arm EDP(s)
20014	Process Release Call req.ind
20015	Process Initiate Call Attempt req.ind

11.3.2 BASIC CALL UNRELATED PROCESS SIB

11.3.2.1 Description

The BASIC CALL UNRELATED PROCESS (BCUP) SIB provides the SCF with access to CUSF call unrelated processing capabilities. For IN CS-2, these capabilities include:

- *Call unrelated process setup capabilities*: Capabilities to influence call unrelated processing (e.g. user registration, screening).
- *Call unrelated process clearing*: Capabilities to release call unrelated process/association.

The CUSF can invoke BCUP capabilities:

- The CUSF invokes BCUP capabilities when it detects a Trigger Detection Point (TDP) during basic call unrelated processing that leads to sending to the SCF one of the family of DP-specific initial information flows. TDP-R and TDP-N are used with the same manner as for the BCSM.
- The SCF invokes BCUP capabilities when it sends a Initiate Association information flow to the CUSF outside the context of existing control relationship. This information flow may or may not establish a new control relationship between the CUSF and the SCF, as dictated by the SCF.

Once a control relationship is established, the SCF can send call processing instructions to the CUSF in the form of one or more information flows (e.g. Release Association as described below). These are very similar to the BCP case.

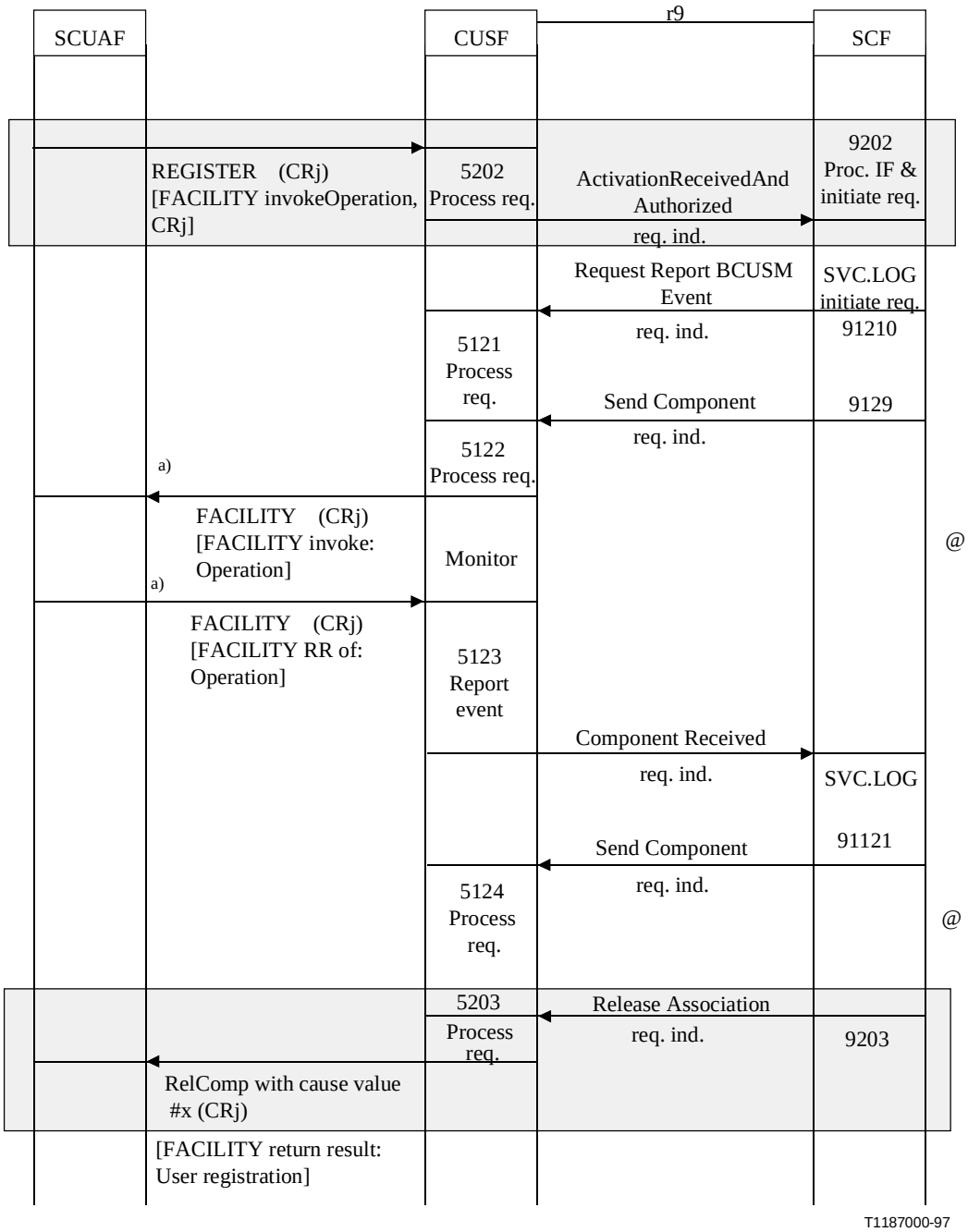
These CUSF-SCF information flow interactions are illustrated in the information flow diagrams, and the individual information flows are briefly described in 11.3.2.2.2.

The usage and sequence of information flows depend on each service specification and on the ROSE procedures.

11.3.2.2 Information flows

11.3.2.2.1 Diagrams

The general information flows and functional entity actions to support BCUP capabilities invoked by the CUSF are very similar to the BCP. See Figure 11-100.



Is relevant to the BCUP and other parts are for explanatory purposes only.

@ These patterns can be repeated any number of times before the association between the SCUAF and the CUSF is released.

a) Depends on the physical configuration; however, in IN CS-2 only the DSS 1 is assumed for the underlying layer.

NOTE – This stage 2 assumes CR management will be realized between CUSF and CCF.

Figure 11-100/Q.1224 – Information flow diagram BASIC CALL UNRELATED PROCESS SIB

11.3.2.2.2 Definition of information flows

This subclause briefly defines the BCUP information flows. See subclause 12.7 for detailed information flow and information element descriptions.

1) *Initial and report information flows*

   a) DP-specific initial information flow family – Family of information flows from the CUSF to the SCF to request instructions from the SCF. When a trigger is detected at a specific DP in the BCUSM, the CUSF generates the corresponding DP-specific initial information flow. The specific BCUSM DP is reflected in the corresponding information flow name.

      – Activation Received and Authorized req.ind;

      – Component Received req.ind;

      – Association Release Requested req.ind.

2) *Call unrelated process setup and clearing*

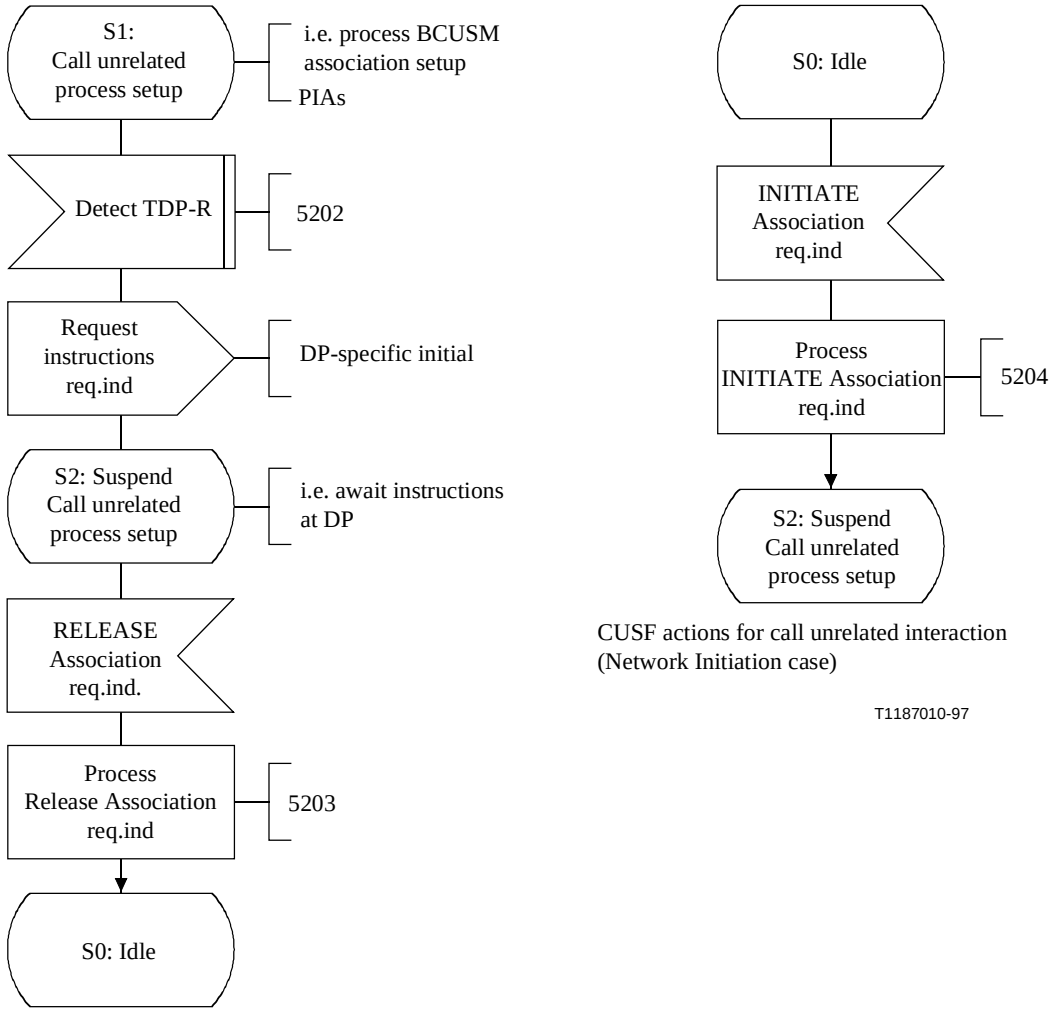
   a) Release Association req.ind – Information flow from the SCF to the CUSF to release an association during the call unrelated processing being suspended at a DP.

3) *Call unrelated process Initiation*

   a) Initiate Association req. ind. – Information flow from the SCF to the CUSF to initiate a new call unrelated process within the CUSF.

11.3.2.3 SDLs

See Figure 11-101.



CUSF actions for call unrelated interaction

NOTE – BCUSM events are handled within the User Interaction SIB.

Figure 11-101/Q.1224 – CUSF actions for BASIC CALL UNRELATED PROCESS SIB

11.3.2.4 Functional entity actions

SCF-related FEAs

Reference number	*Action*
9201	Process request
	– Process initial information flow
9202	Process request requiring response
	– Process initial information flow (e.g. Activation Received And Authorized)
9203	Send response to request
	– Send Release Association information flow (if needed)

CUSF-related FEAs

Reference number	*Action*
5201	Detect trigger detection point – notification
	– Send DP-specific initial req.ind
5202	Detect trigger detection point – request
	– Send DP-specific initial req.ind and suspend call unrelated association and process handling
5203	Process Release Association req.ind
	– Release association the user and the network with remaining component to be delivered
5204	Process Initiate Association req.ind

11.4 Stage 2 description of other distributed functionality

Due to the mapping of global functionality in the global functional plane, as represented by SIBs, to distributed functionality in the distributed functional plane, as represented by information flows and functional entity actions, there is a need for additional distributed functionality that is not reflected in SIBs (e.g. to protect the network against overload, distributed processing errors, or physical network failures). This functionality exists to manage the information flows between functional entities, which only exist on the distributed functional plane. For IN CS-2, this functionality consists of activity test and call gap functionality, as described in this subclause.

11.4.1 Activity test functionality

11.4.1.1 Description

The activity test functionality provides a way in which the SCF can test for the continued existence of a relationship with the SSF or with another SCF, or with the CUSF. For the SCF-SCF relationship, either SCF can initiate the test.

11.4.1.2 Information flow diagrams

Figure 11-102 depicts the information flows and functional entity actions involved in executing the activity test functionality for the SCF to SSF/CCF case. Figure 11-103 depicts the information flows and functional entity actions involved in executing the activity test functionality for the SCF to SCF case. Figure 11-104 depicts the information flows and functional entity for the CUSF case.

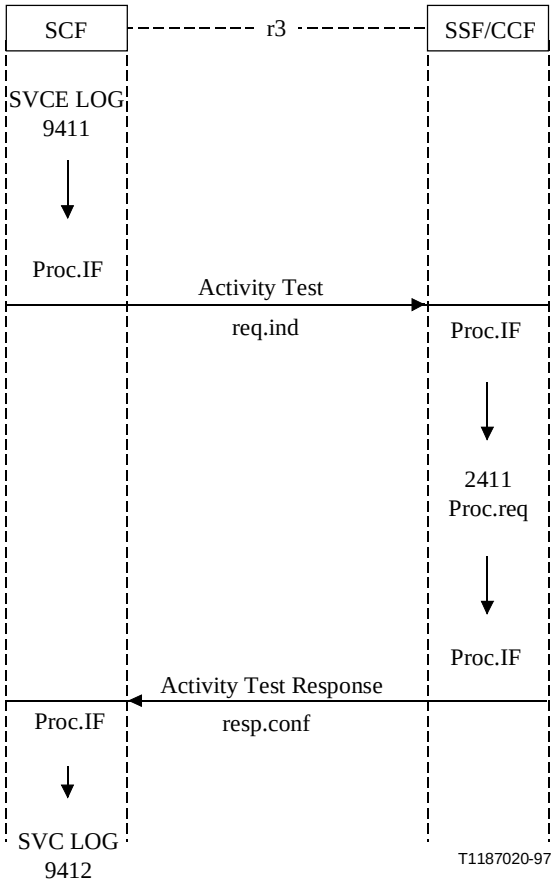


Figure 11-102/Q.1224 – Information flow diagram activity test functionality, SCF to SSF/CCF relationship

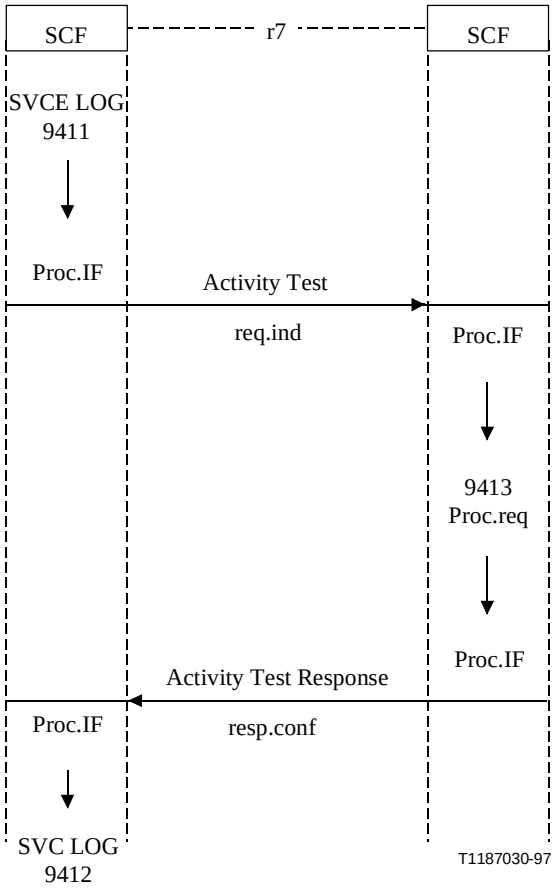


Figure 11-103/Q.1224 – Information flow diagram activity test functionality, SCF to SCF relationship

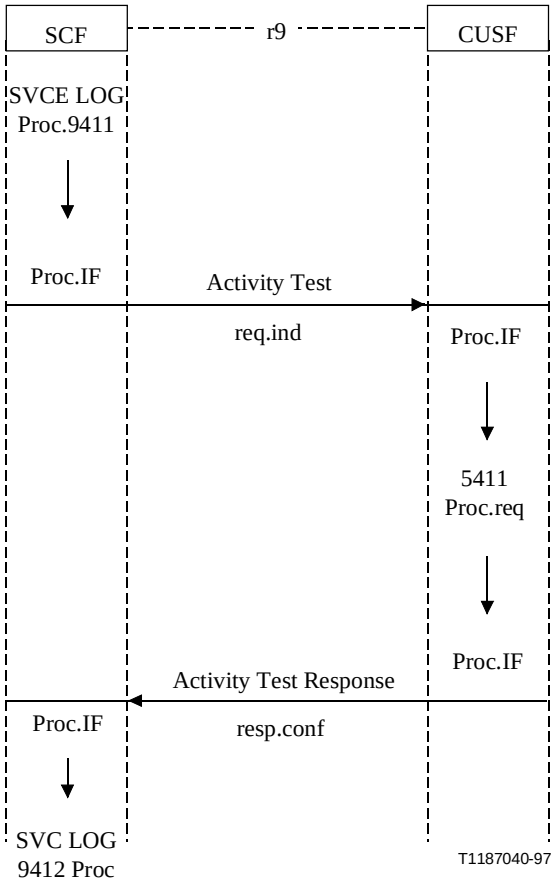


Figure 11-104/Q.1224 – Information flow diagram activity test functionality, SCF to CUSF relationship

11.4.1.3 SDLs

Figure 11-105 presents the SDL diagram for the SCF, CUSF and SSF/CCF processing of the activity test functionality.

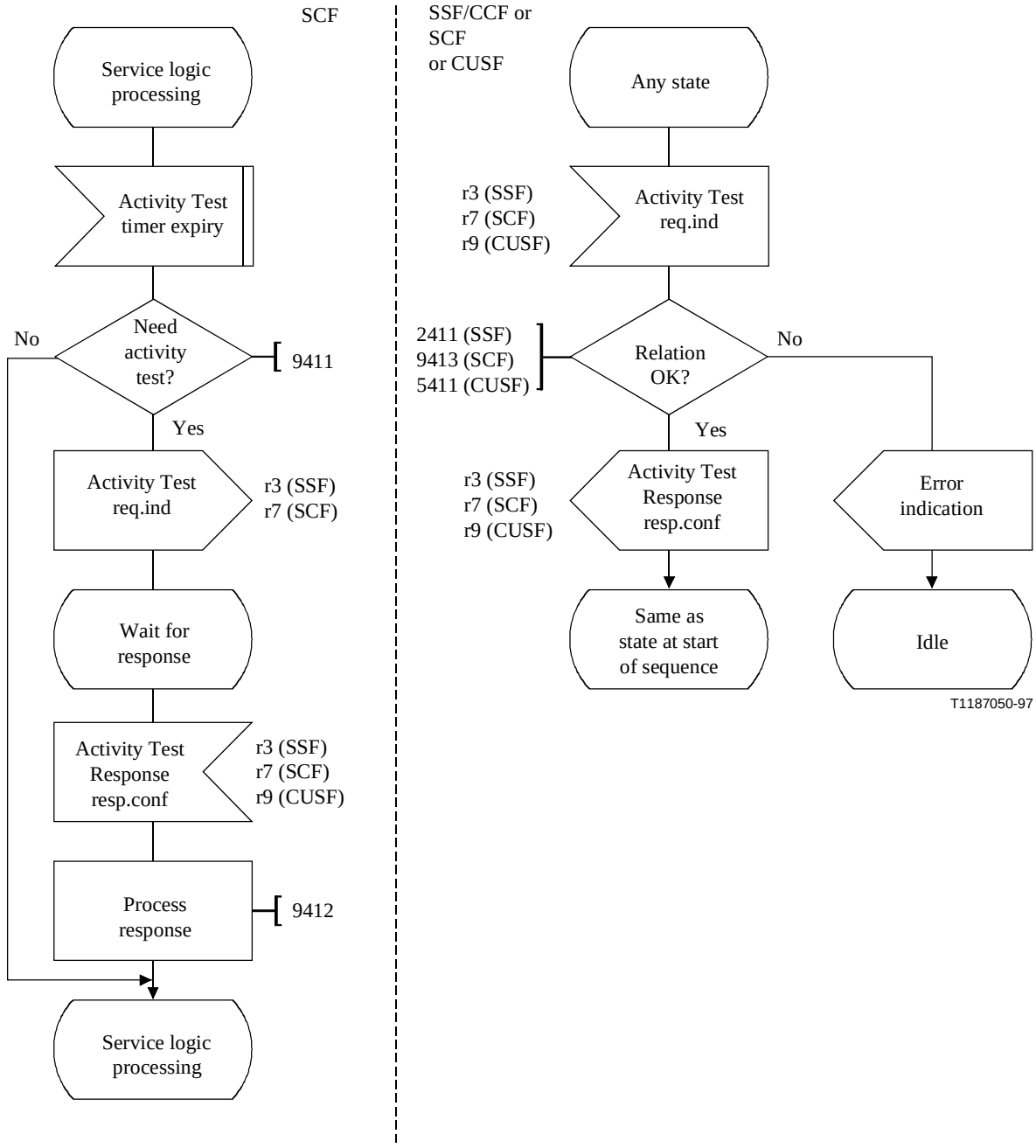


Figure 11-105/Q.1224 – SDLs for activity test

11.4.1.4 Functional entity actions

SCF-related FEAs

Reference Number		*Action*
9411	–	Initiate activity test process
	–	Formulate and send Activity Test req.ind
9412	–	Receive and analyse Activity Test Response resp.conf
	–	Process information as required

9413	Process request – Receive and analyse Activity Test req.ind – Check for continued existence of relationship – Formulate and send Activity Test Response resp.conf

SSF-related FEAs

Reference Number	*Action*
2411	Process request – Receive and analyse Activity Test req.ind – Check for continued existence of relationship – Formulate and send Activity Test Response resp.conf

CUSF-related FEAs

Reference Number	*Action*
5411	Process request – Receive and analyse Activity Test req.ind – Check for continued existence of relationship – Formulate and send Activity Test Response resp.conf

11.4.2 Call gap capability

11.4.2.1 Description

A CCF/SSF can offer large volumes of message traffic to an SCF in a relatively short period of time. Congestion can occur within an SCF if traffic is allowed to grow beyond engineered levels, increasing message response times and call failure rates. When congestion is detected, an SCF can activate call gap controls at CCF/SSF, requesting the CCF/SSF to reduce the rate at which service requests are sent to the SCF.

The call gap capability limits the number of calls that are allowed through an IN-structured network by filtering calls with given characteristics. The filtering is applied only to those calls related to IN-provided service features that request the assistance of IN functions (i.e. applies to all TDPs). Calls are blocked for a specified duration at specified intervals. Call gapping is network initiated. The SCF sends Call Gap req.ind asynchronously with the execution of any service logic processing program. These information flows are sent as part of the response to an SSF query. Calls that do not request the assistance of IN functions (“non IN-provided calls”) are not affected by this capability.

Use of this capability by the SCF to gap queries and updates at the SDF is not for standardization in IN CS-2.

11.4.2.2 Information flow diagrams

Figure 11-106 depicts the information flows and functional entity actions to support call gapping functionality for service management purposes.

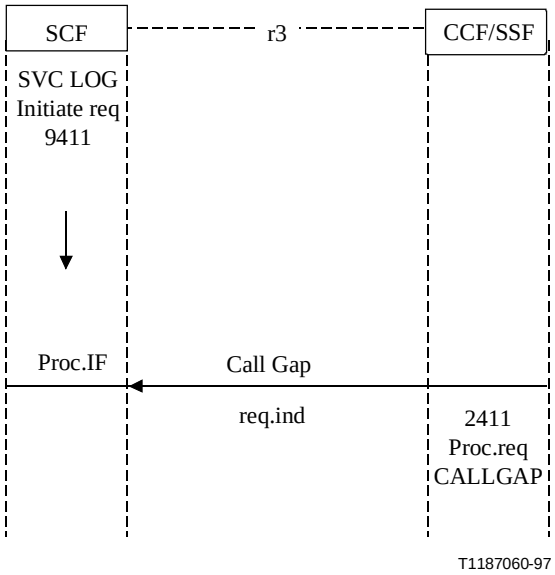


Figure 11-106/Q.1224 – Information flow diagram, call gap for service management

11.4.2.3 SDLs

Figure 11-107 presents the SDL diagram for the SCF processing of the call gap functionality.

Figure 11-108 presents the SDL diagram for the CCF/SSF processing of the call gap functionality.

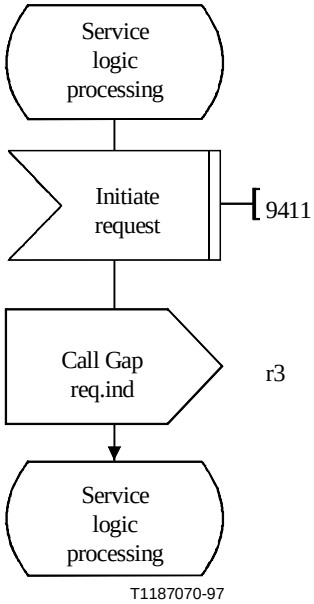


Figure 11-107/Q.1224 – SCF actions for the call gap capability

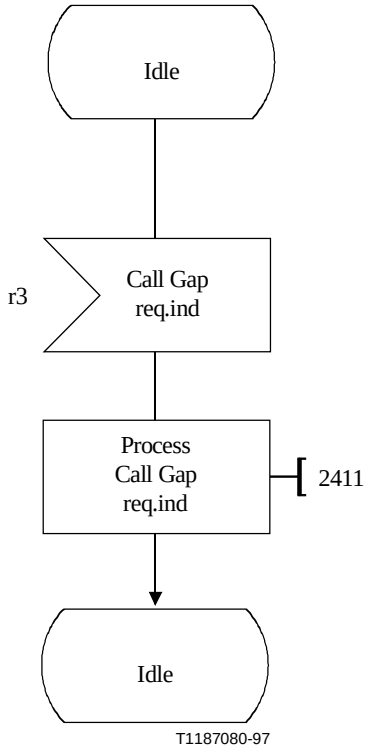


Figure 11-108/Q.1224 – CCF/SSF actions for the call gap capability

11.4.2.4 Functional entity actions

SCF-related FEA

Reference number	*Action*
9411	Initiate request
	– Initiate a Call Gap req.ind

SSF-related FEA

Reference number	*Action*
2411	Process Call Gap req.ind
	– Receive and analyse Call Gap req.ind
	– Apply specified treatment at specified intervals for specified duration

11.5 Distributed service logic

11.5.1 SDL diagrams

The distributed service logic in 11.5 shows the overall behaviour of the SIBs and other distributed functionality in the DFP, as described in 11.2 to 11.4. The SDL process diagrams in 11.5 show the exchange of information flows between functional entities and are functionally equivalent to a combination of the individual SDL fragments from these earlier clauses, combined according to the allowed sequencing rules.

The SDL in the distributed service logic diagrams is very high-level, at the same level of detail as the SDL fragments in 11.2 to 11.4. No details of any internal processing (FEAs) are shown, however, as the intent is to show the overall sequencing of information flows between functional entities. There is no information in the diagrams on the internal models of the functional entities, except where mention is necessary to explain the behaviour (such as the creation of a new Call Segment). The SDL diagrams include timer handling and interactions with some bearer indications (at a very high level) to allow the logic to be as complete as possible.

The rules for sequencing of the information flows between functional entities in the DFP are derived from the finite state machines and procedure descriptions of Recommendation Q.1228. While generally similar, there are differences between the sequencing of information flows in the distributed service logic and the sequencing of operations as described by the finite state machines in the physical plane. For example, information flows cannot be sent until any pending response to a previously-sent information flow has been received. As a result, the sequences of information flows for authentication on the SCF-SDF, SDF-SDF and SCF-SCF interfaces differ from the permissible operation sequences in the physical plane. It should also be noted that several information flows may map to one operation and several operations may map to one information flow.

Error handling is not included in detail, although some error cases are shown. Error handling in the distributed service logic is only relevant where it must be handled by the functional entity at the logical level; many errors are handled only by the protocol. Cleardown procedures are included, since Call Information Report and charging information flows are sent during cleardown.

The signal definitions are incomplete and are given for locally-defined signals only; the data carried by the signals is not declared. All other information flow names are as defined in clause 12. The locally-defined names are based in general on the event names used in Recommendation Q.1228. In some cases new names have been provided for signals where Recommendation Q.1228 does not provide a name.

11.5.2 Distributed service logic for SSF

Figure 11-109 contains the SDL diagrams describing the distributed service logic for the SSF, including User Service Interaction and management information flows.

PROCESS DSL_SSF_CS2 PAGE 1(22)

```
/*
Distributed service logic for SSF.
Based on clause 11, Recommendation Q.1228.
*/
```

```
/* Timer Tssf can have different values, as described in Q.1228, clause 11.
When a timer is restarted (RESET), the value used is denoted here as a variable
duration, DURATION. This takes a pre-determined set value unless replaced by
a new value in a Reset Timer information flow. In the latter case, the new value
remains in force unless itself replaced.

Handling of timer expiry is included in the distributed service logic.
*/
```

```
/* Local signal definitions - First part
These signals to and from CCF are  internal indications which are not defined in the IN CS-2 Recommendations.
The names are therefore local names only and are used only to assist specification of the logic. */

/* From CCF */
SIGNAL Forward Connection Released, Abandon, Disconnect;

 /* To CCF */
SIGNAL Terminate Call, Connect SRF, Route To Default, SRF Release Request;
```

```
/* Local signal definitions - Second part.
These signals from internal (SSF) logic are internal indications which are not defined in the IN CS-2 Recommendations.
The names are therefore local names only and are used only to assist specification of the logic. */

 /* From SSF service logic */
 SIGNAL  TDP_R, TDP_N, EDP_N, EDP_R;

 /* Local names defined for signals SSF to SCF */
 SIGNAL TDP Event; /* Indicates one of Initial DP or a DP specific information flow */
 SIGNAL EDP Event; /* Indicates one of Event Report BCSM or a DP specific information flow */
```

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Figure 11-109/Q.1224 (sheet 1 of 22) – Distributed service logic for SSF FE

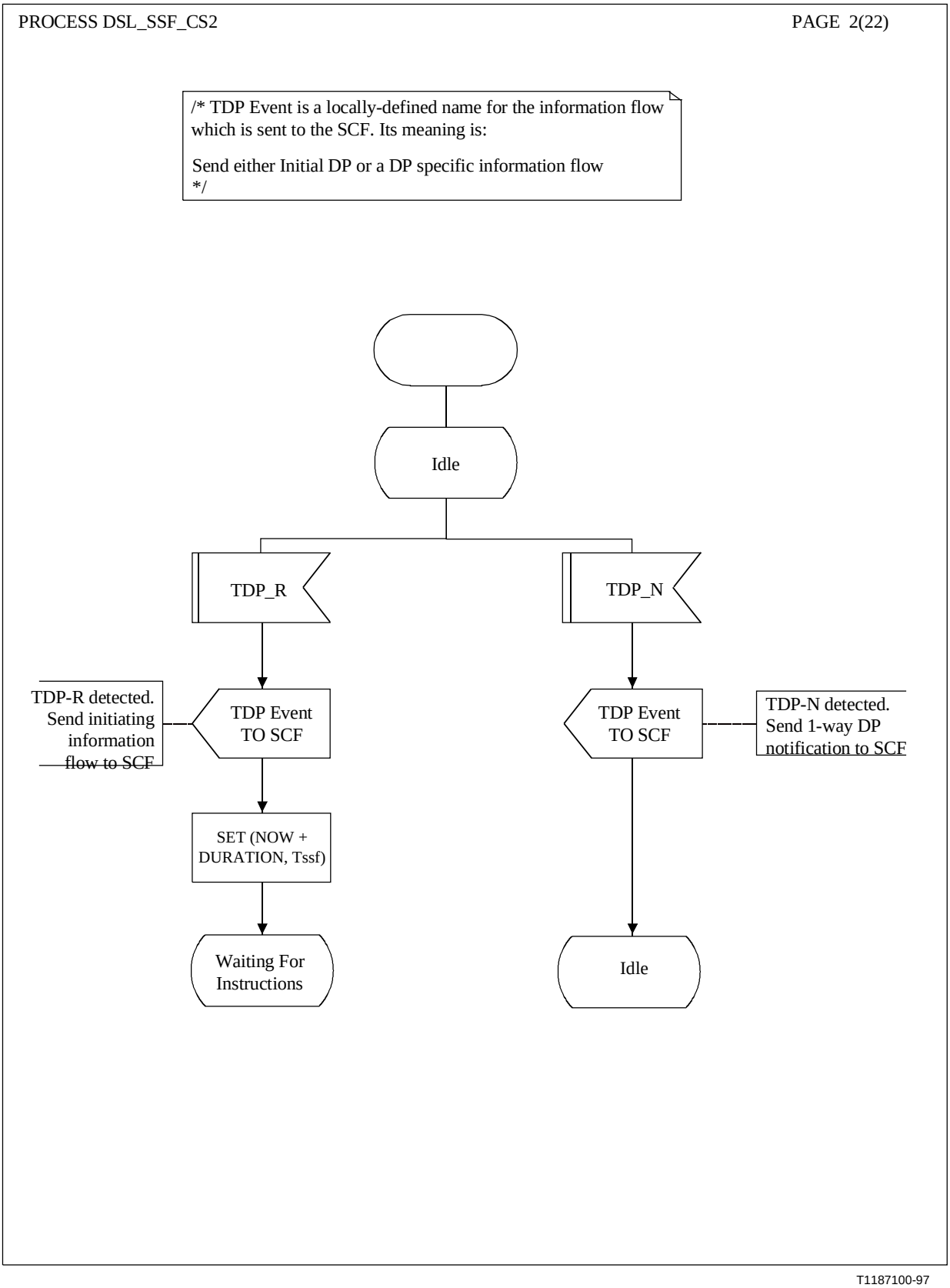

Figure 11-109/Q.1224 (sheet 2 of 22) – Distributed service logic for SSF FE

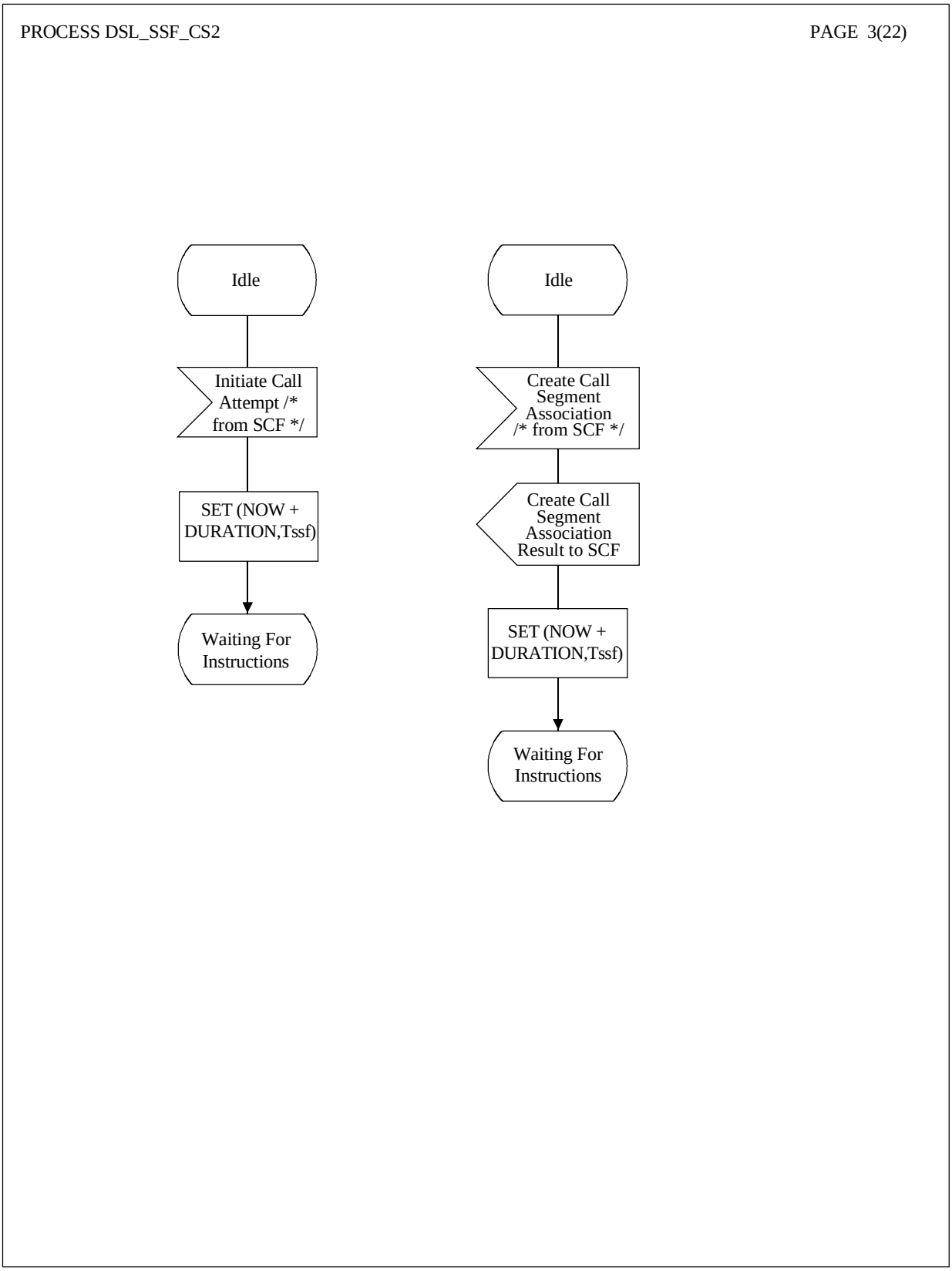

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Figure 11-109/Q.1224 (sheet 3 of 22) – Distributed service logic for SSF FE

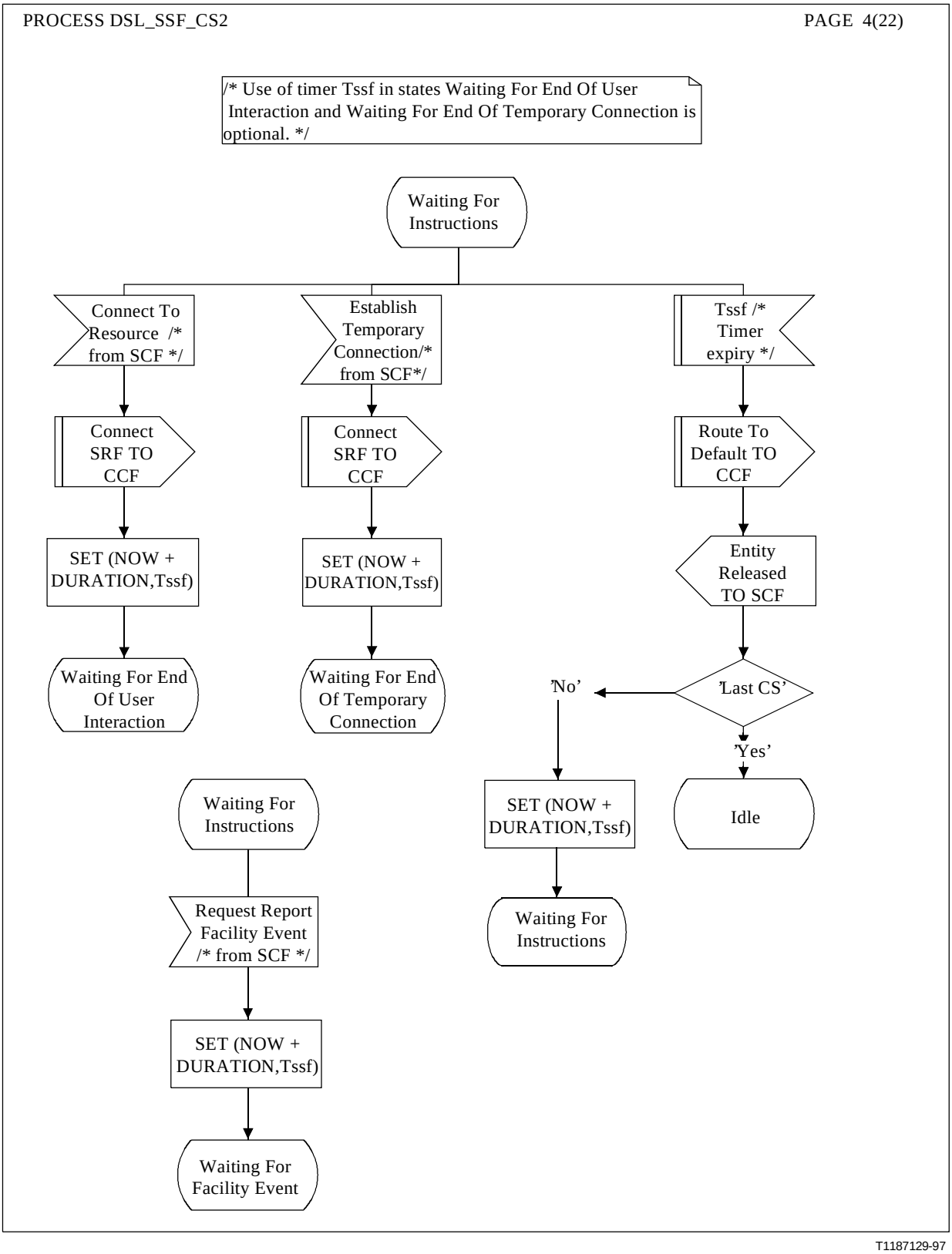

Figure 11-109/Q.1224 (sheet 4 of 22) – Distributed service logic for SSF FE

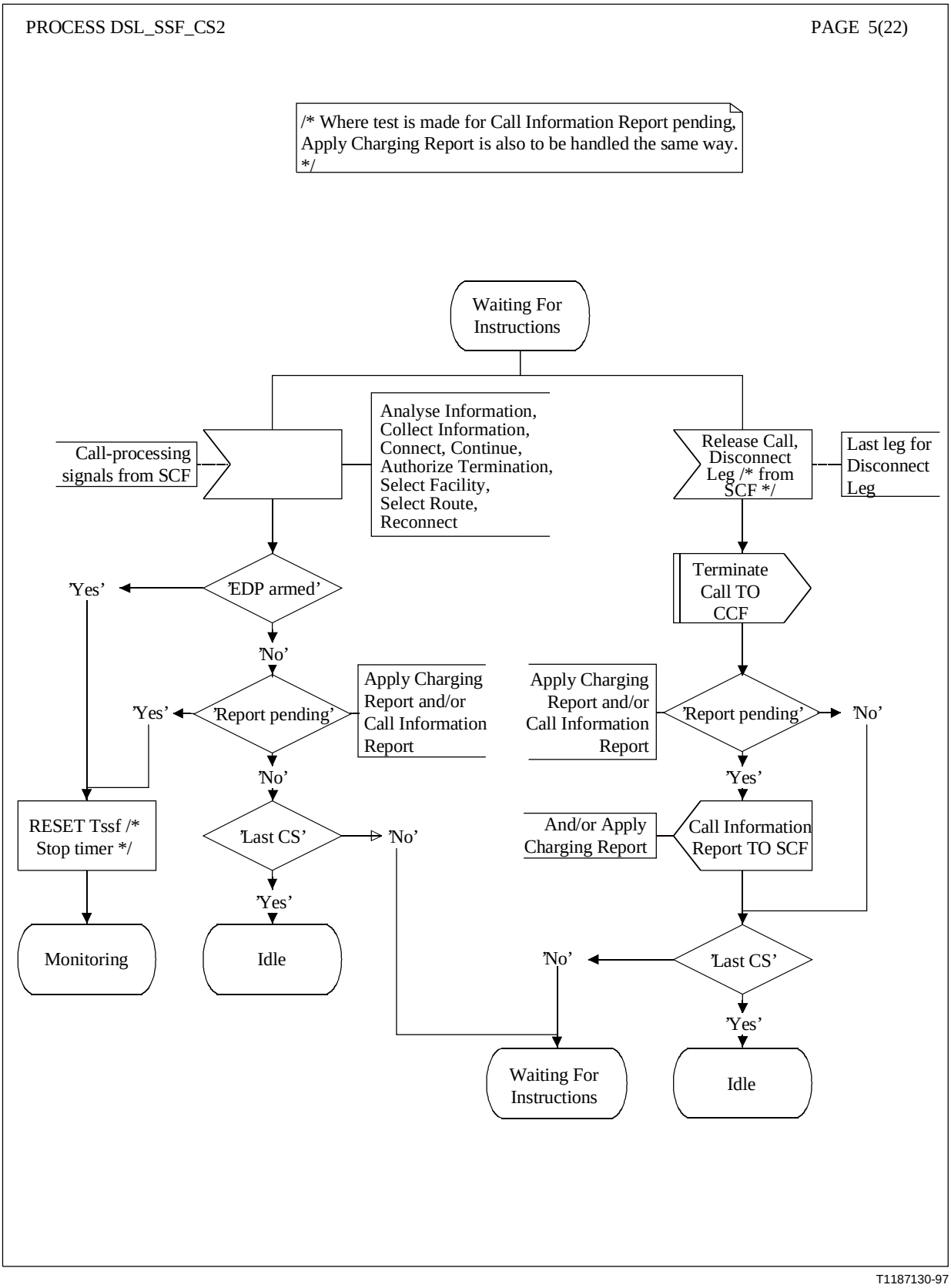

Figure 11-109/Q.1224 (sheet 5 of 22) – Distributed service logic for SSF FE

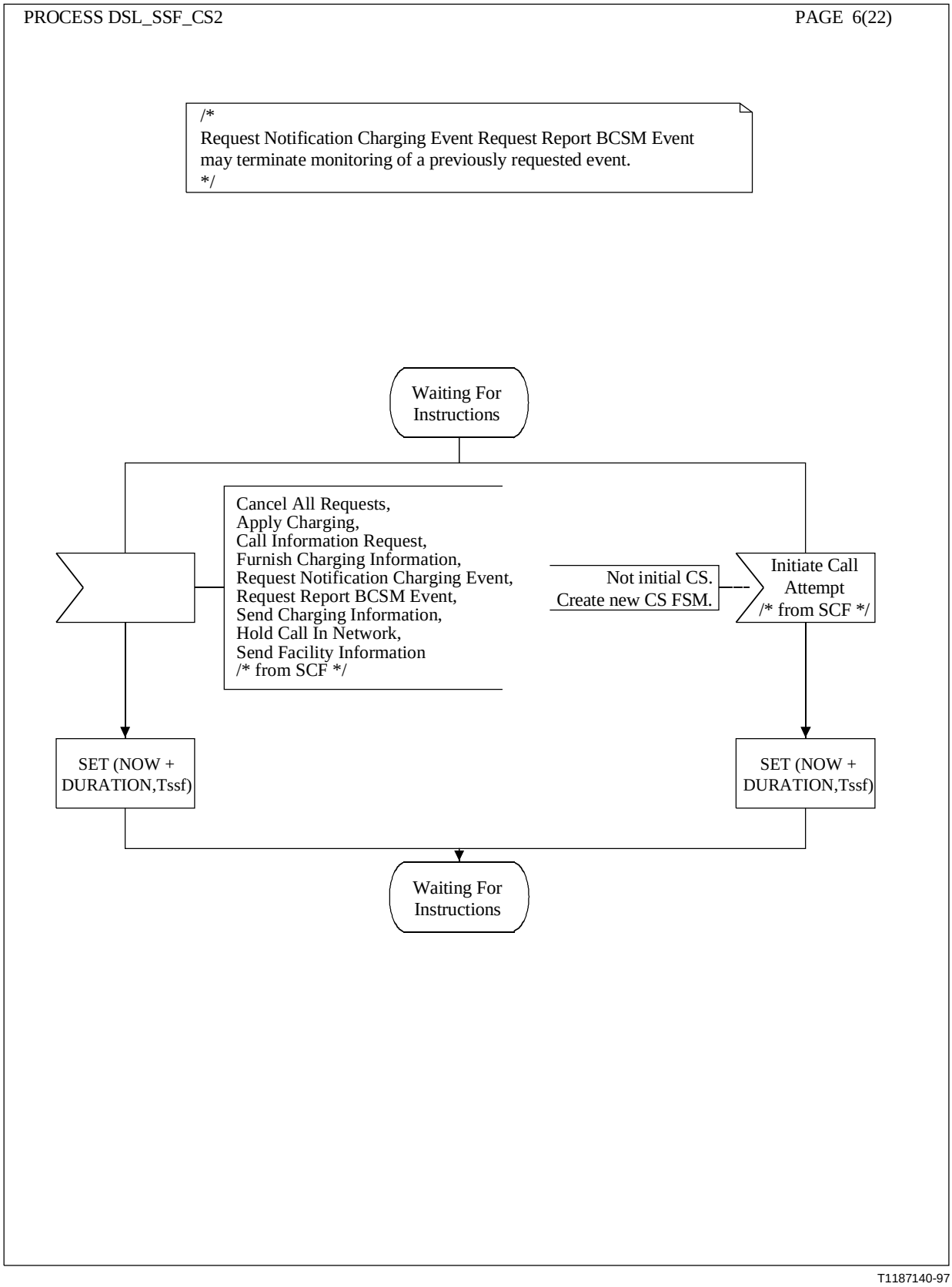

Figure 11-109/Q.1224 (sheet 6 of 22) – Distributed service logic for SSF FE

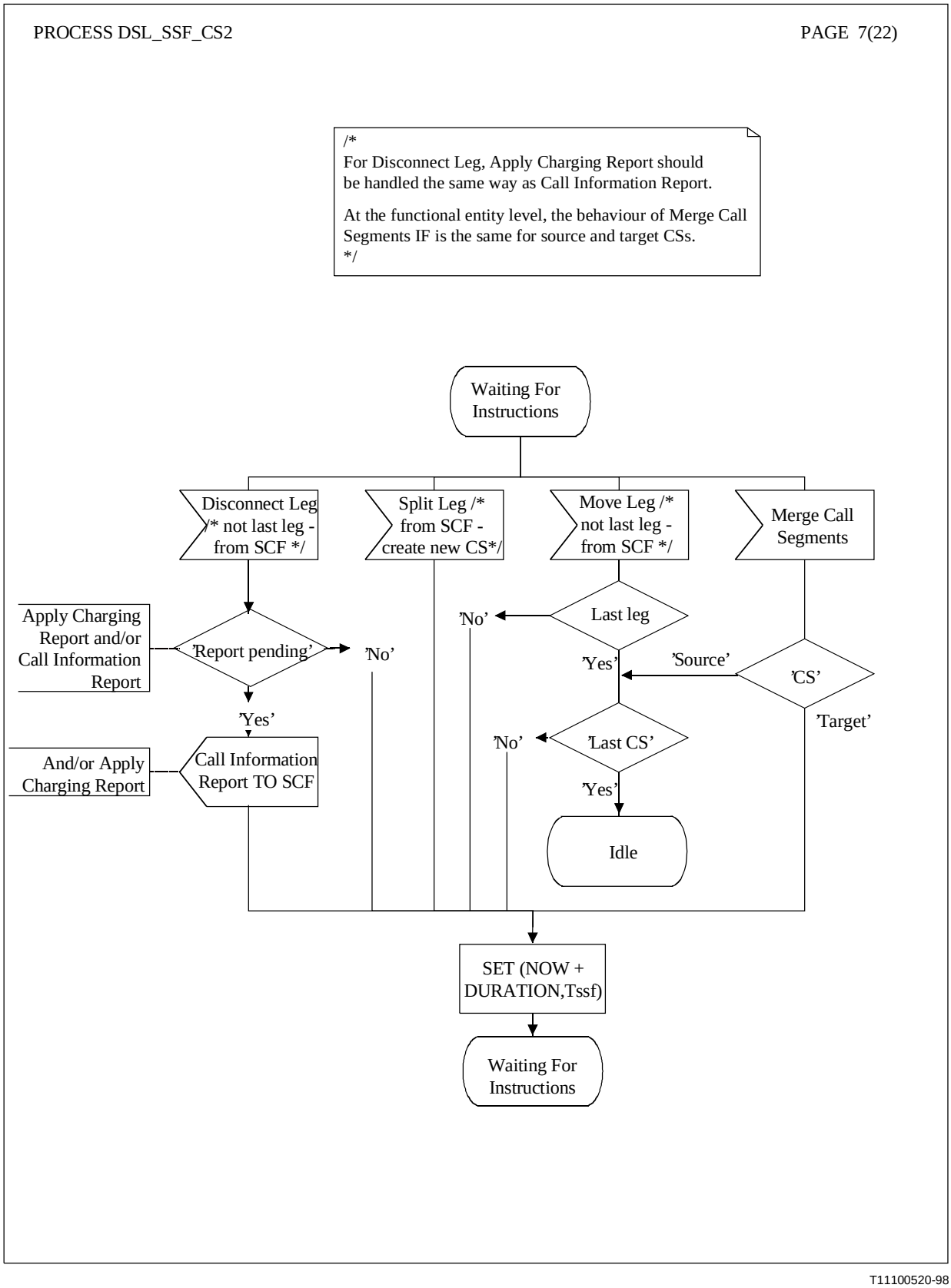

Figure 11-109/Q.1224 (sheet 7 of 22) – Distributed service logic for SSF FE

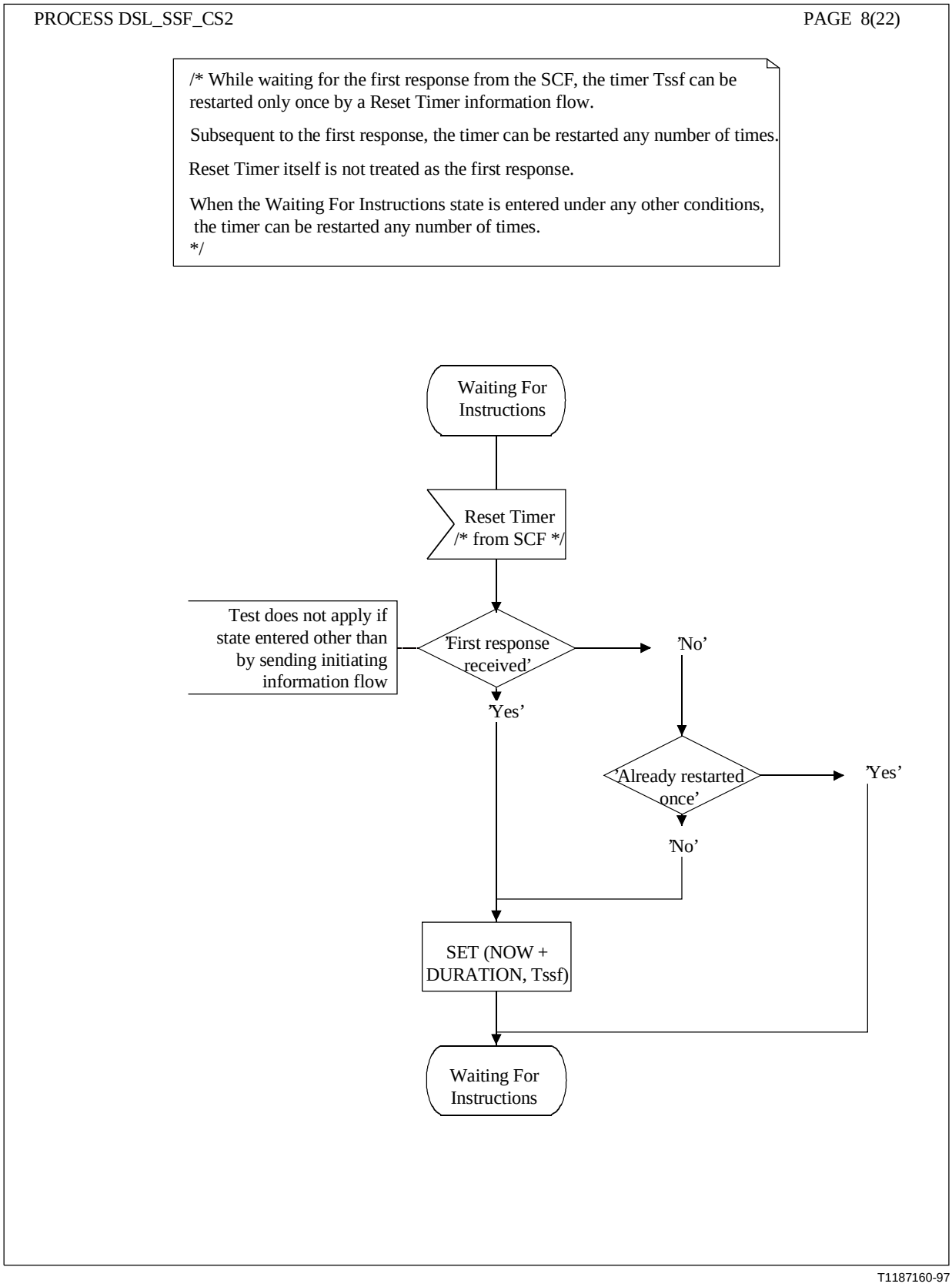

Figure 11-109/Q.1224 (sheet 8 of 22) – Distributed service logic for SSF FE

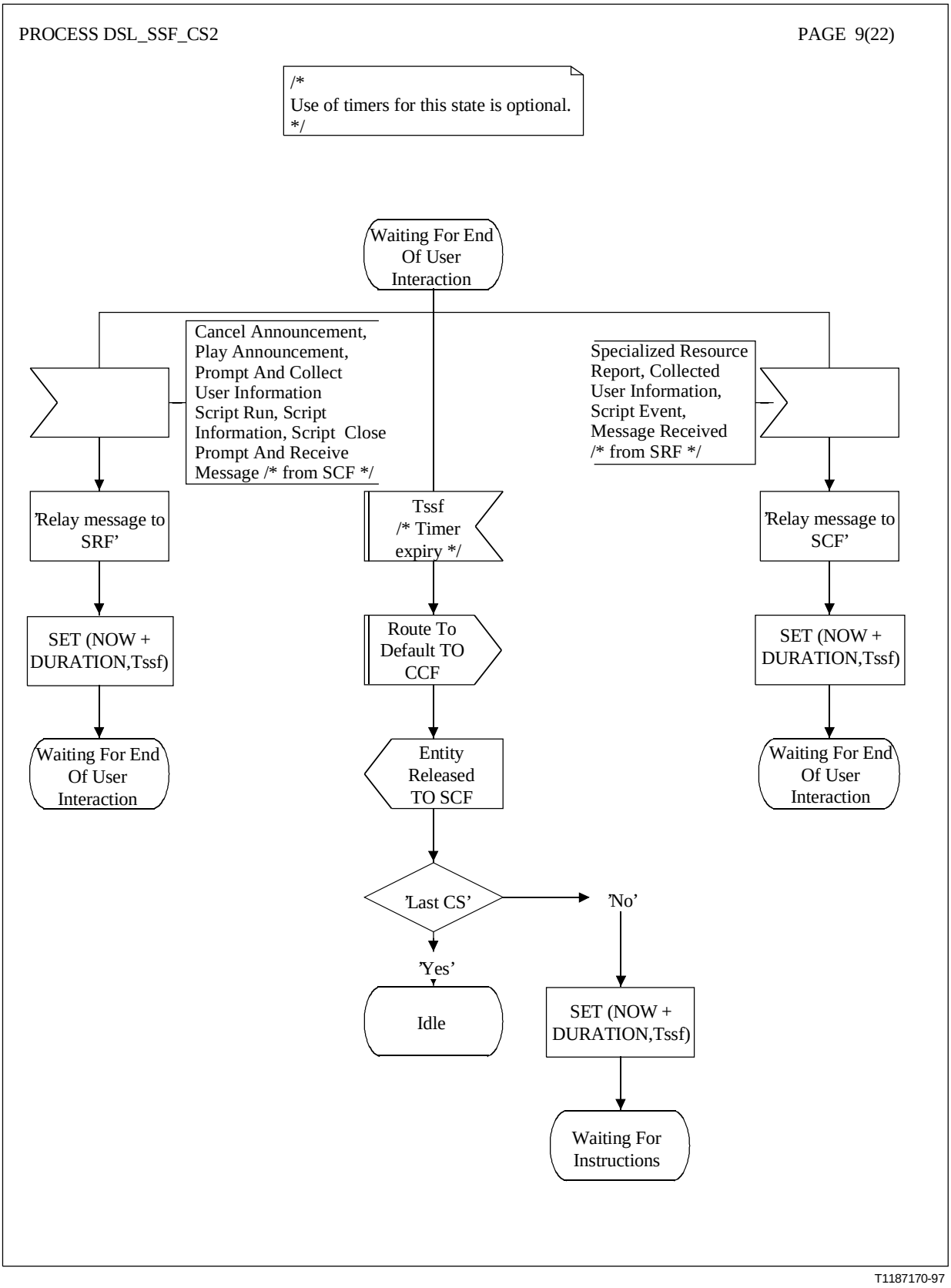

Figure 11-109/Q.1224 (sheet 9 of 22) – Distributed service logic for SSF FE

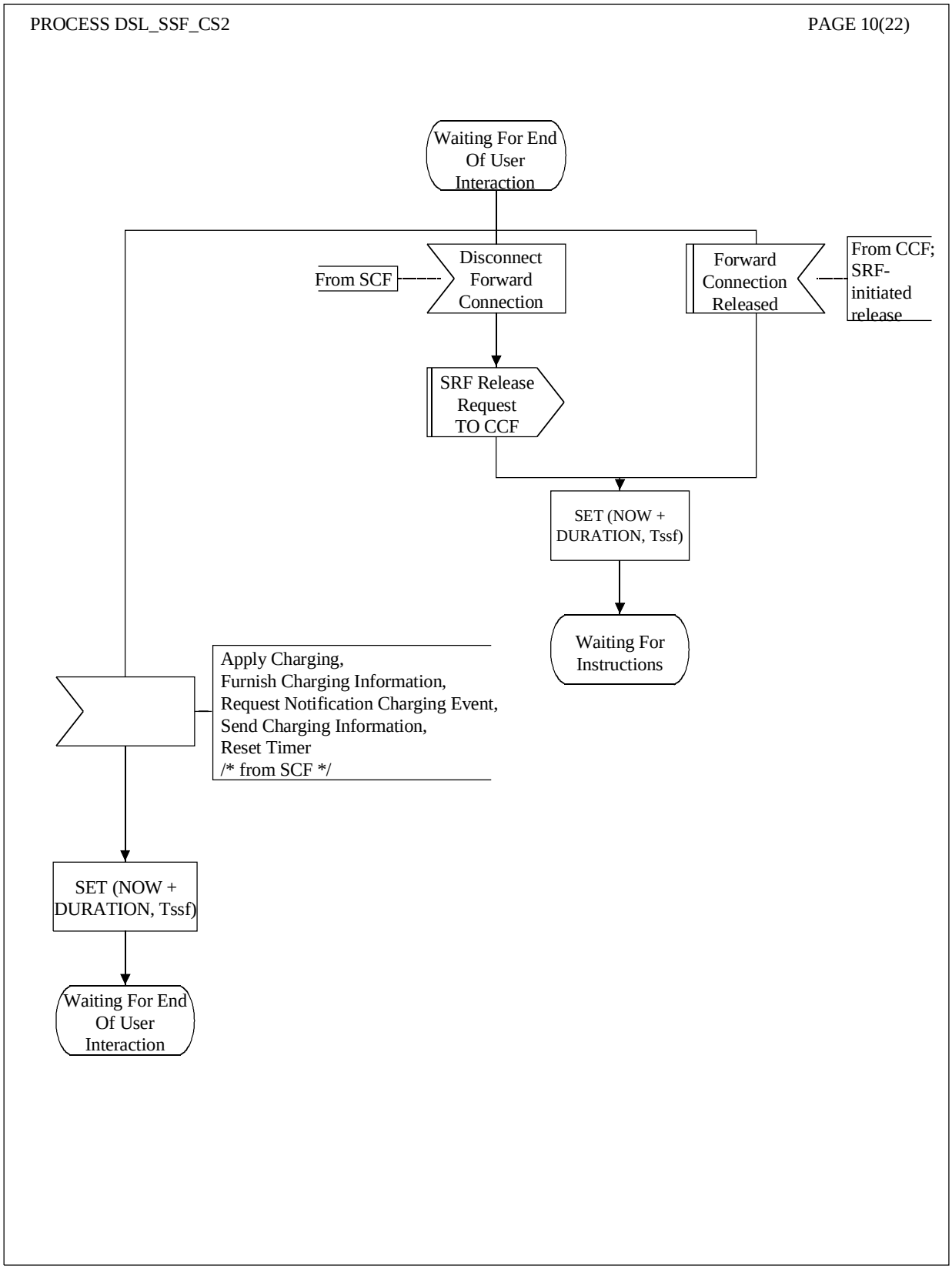

Figure 11-109/Q.1224 (sheet 10 of 22) – Distributed service logic for SSF FE

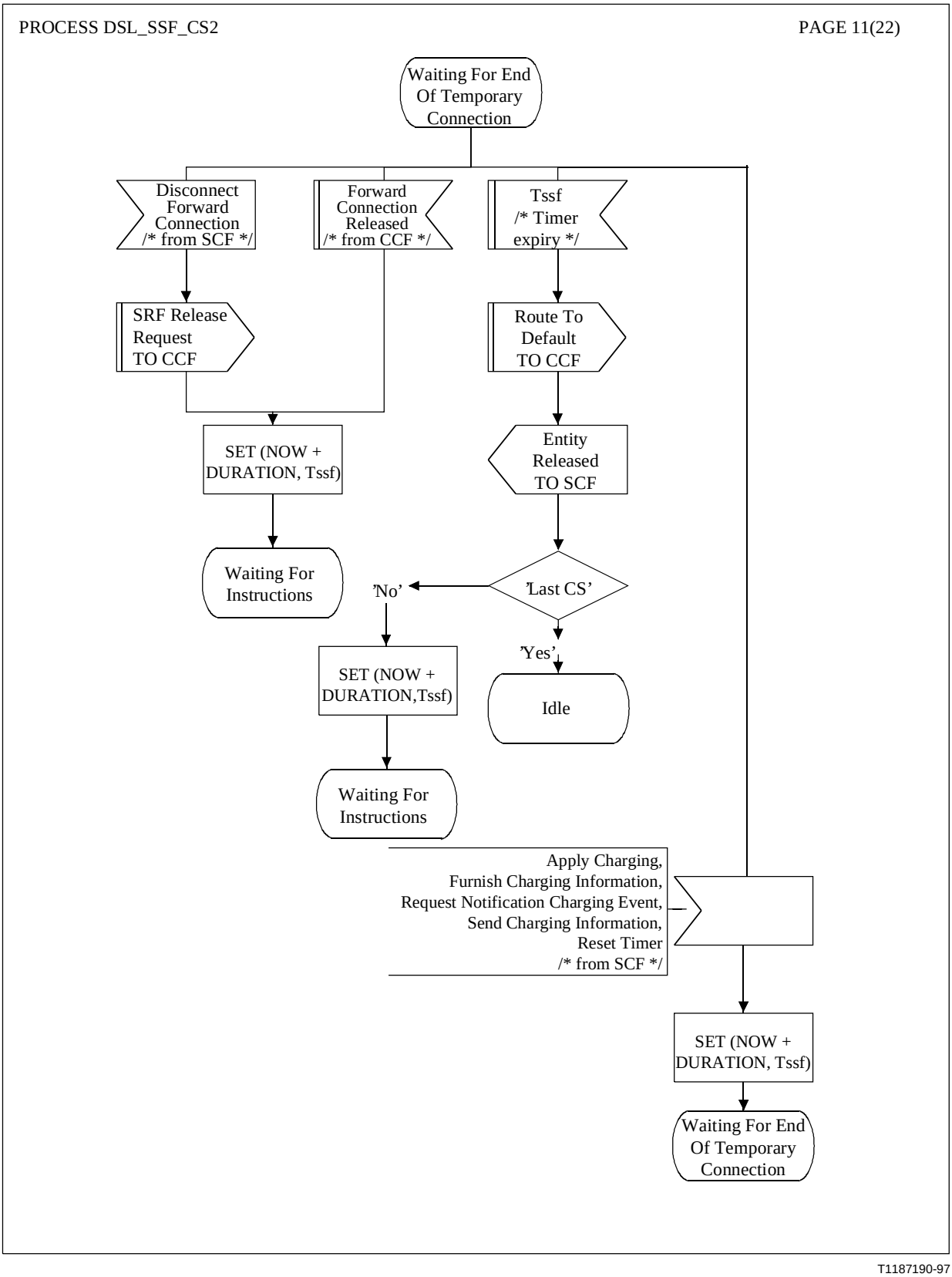

Figure 11-109/Q.1224 (sheet 11 of 22) – Distributed service logic for SSF FE

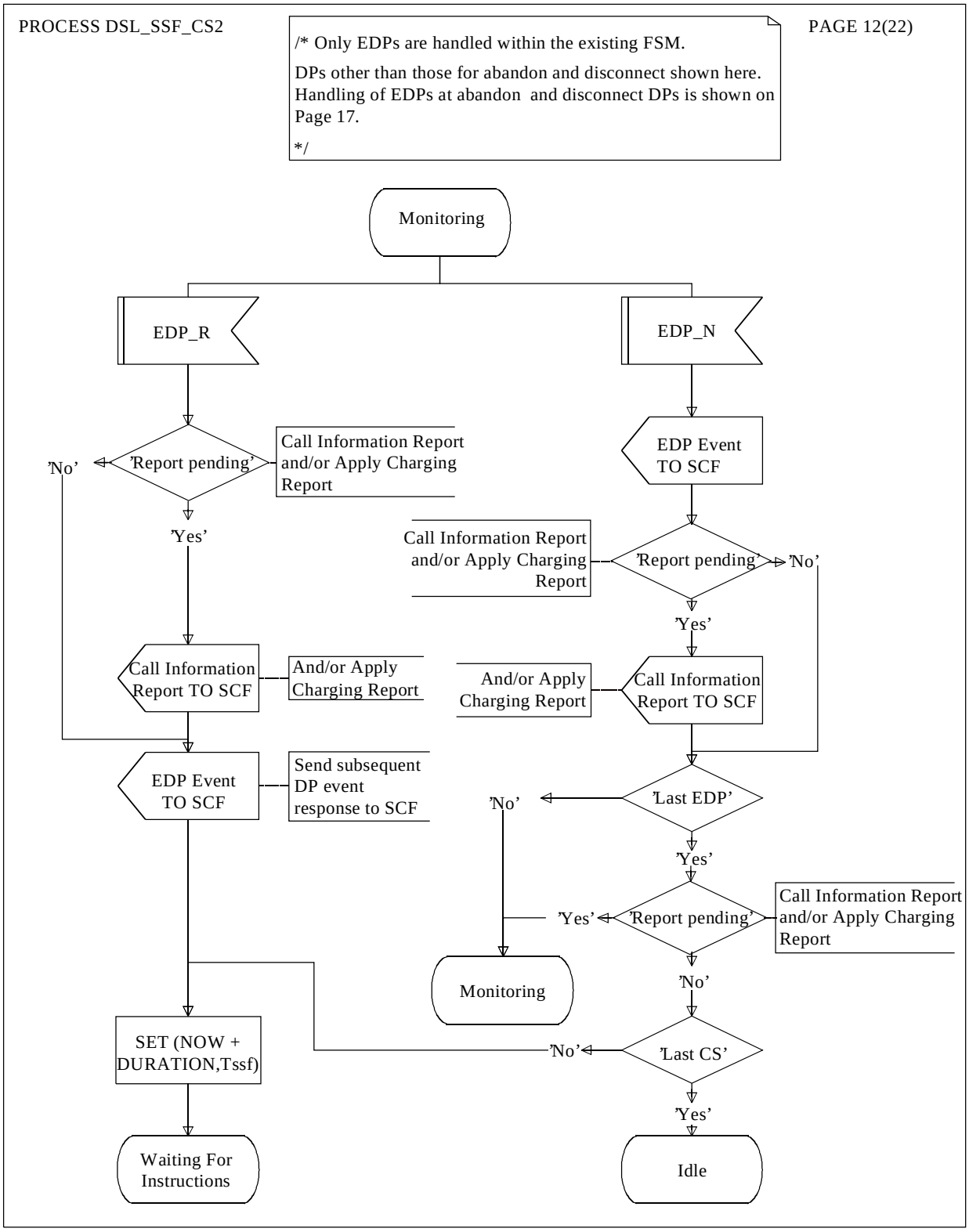

Figure 11-109/Q.1224 (sheet 12 of 22) – Distributed service logic for SSF FE

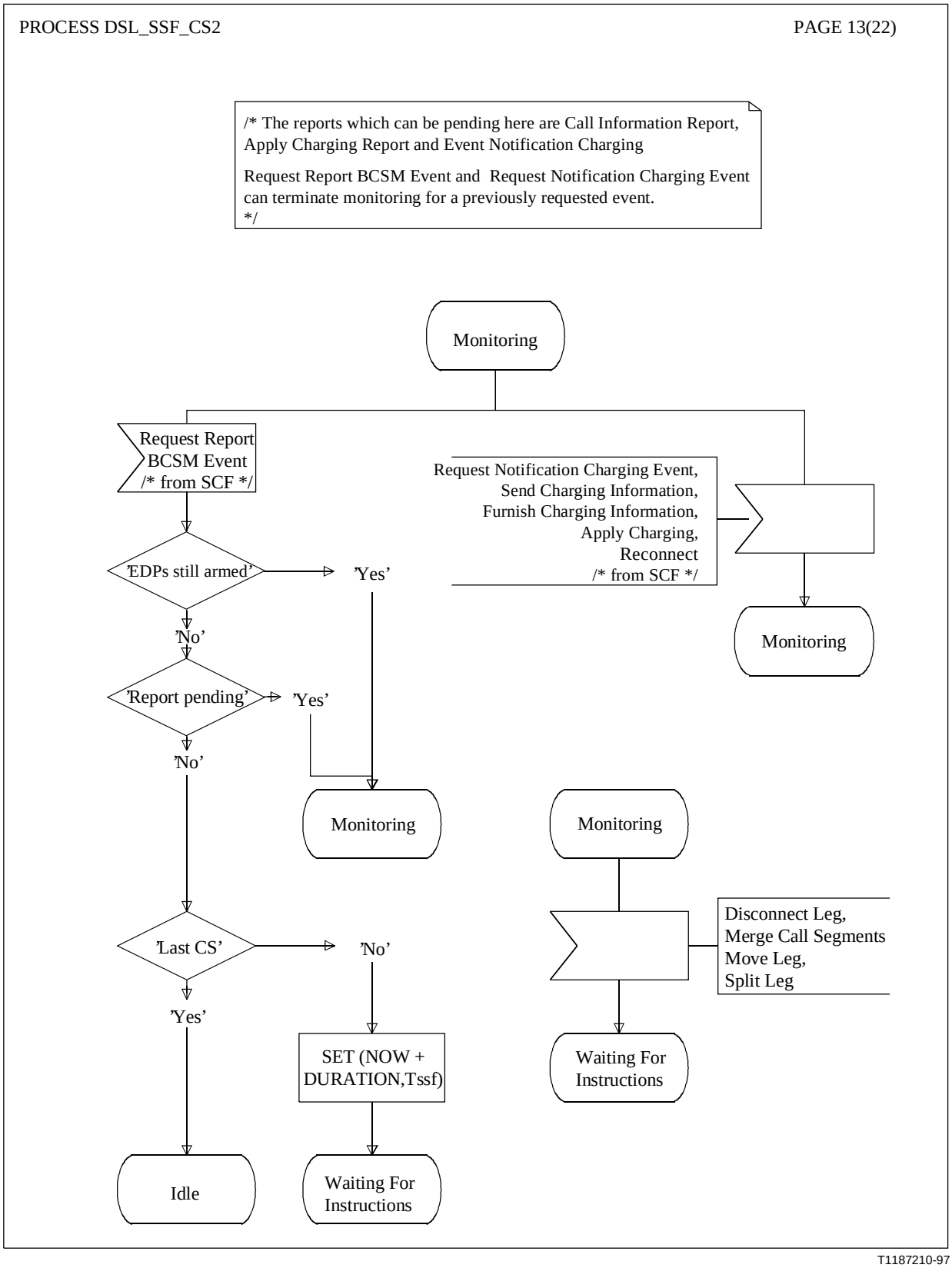

Figure 11-109/Q.1224 (sheet 13 of 22) – Distributed service logic for SSF FE

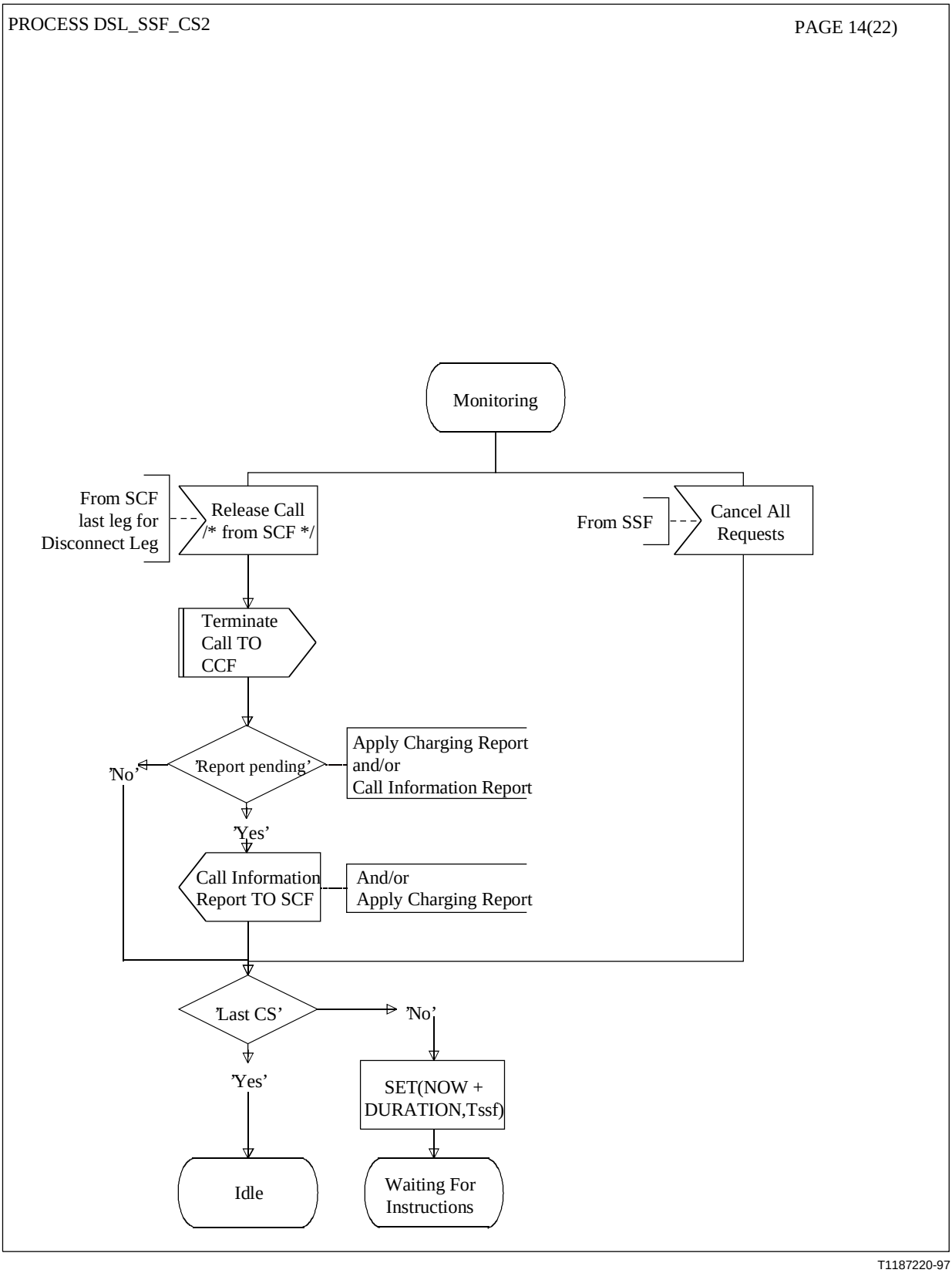

Figure 11-109/Q.1224 (sheet 14 of 22) – Distributed service logic for SSF FE

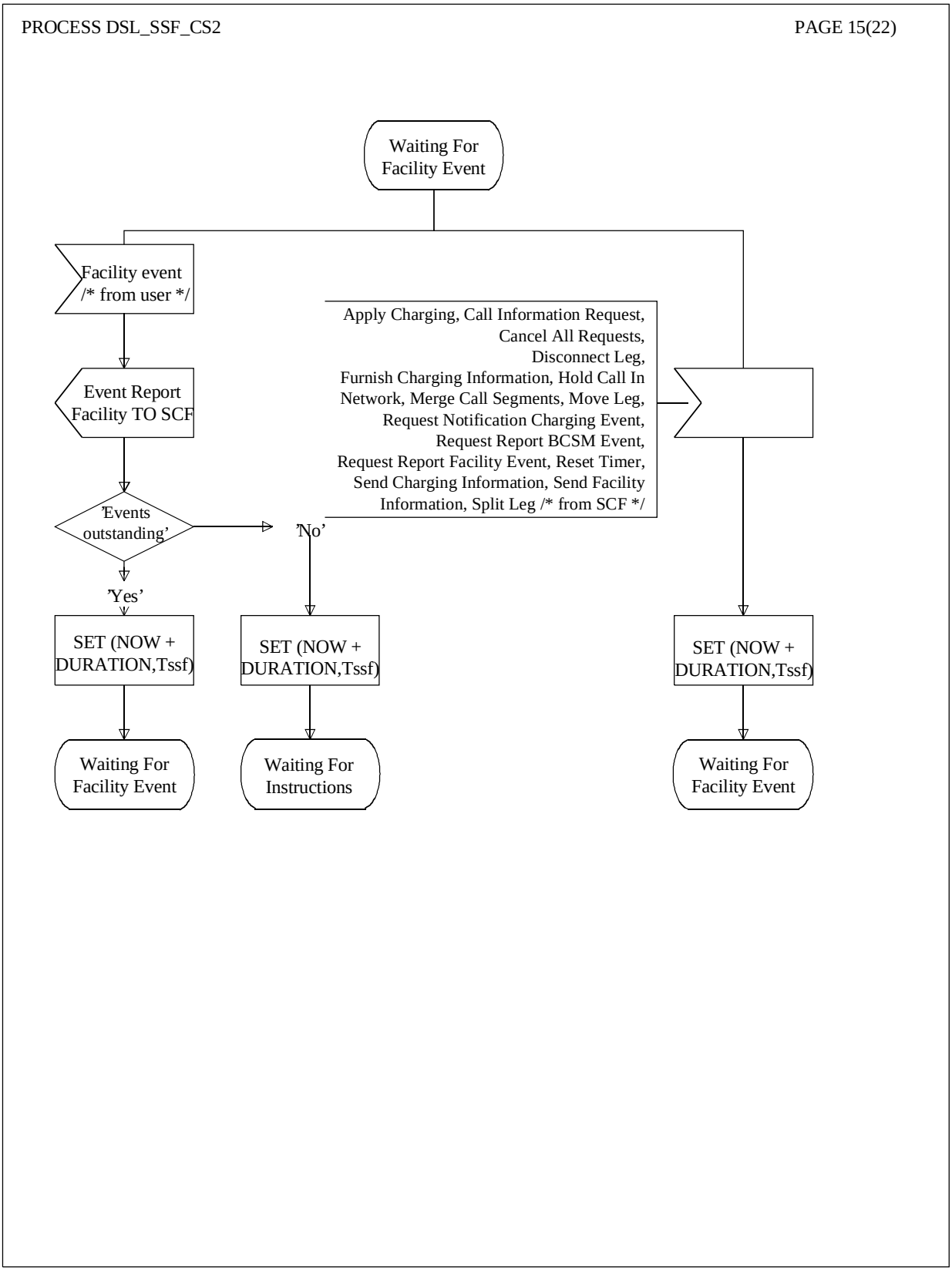

Figure 11-109/Q.1224 (sheet 15 of 22) – Distributed service logic for SSF FE

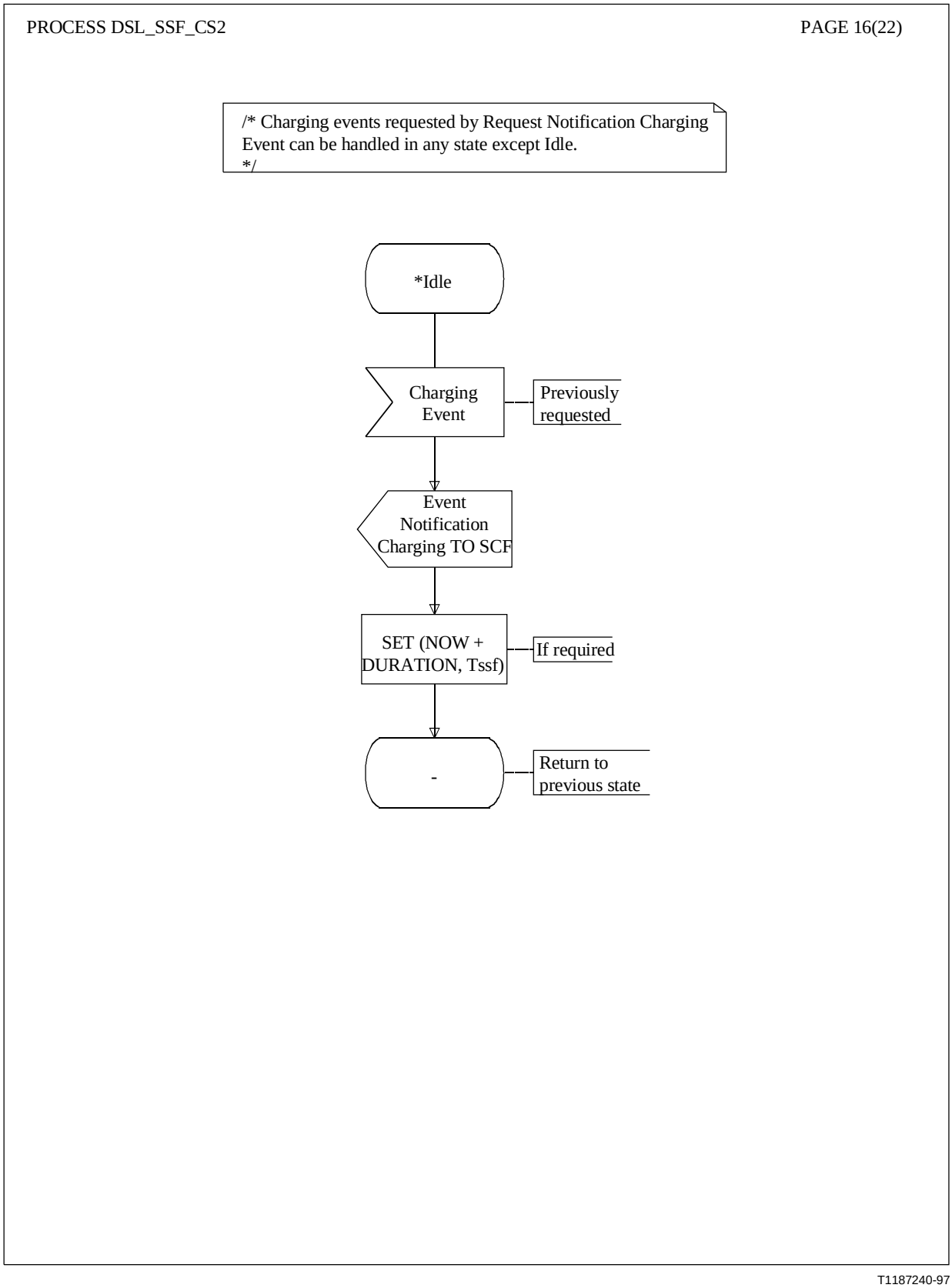

Figure 11-109/Q.1224 (sheet 16 of 22) – Distributed service logic for SSF FE

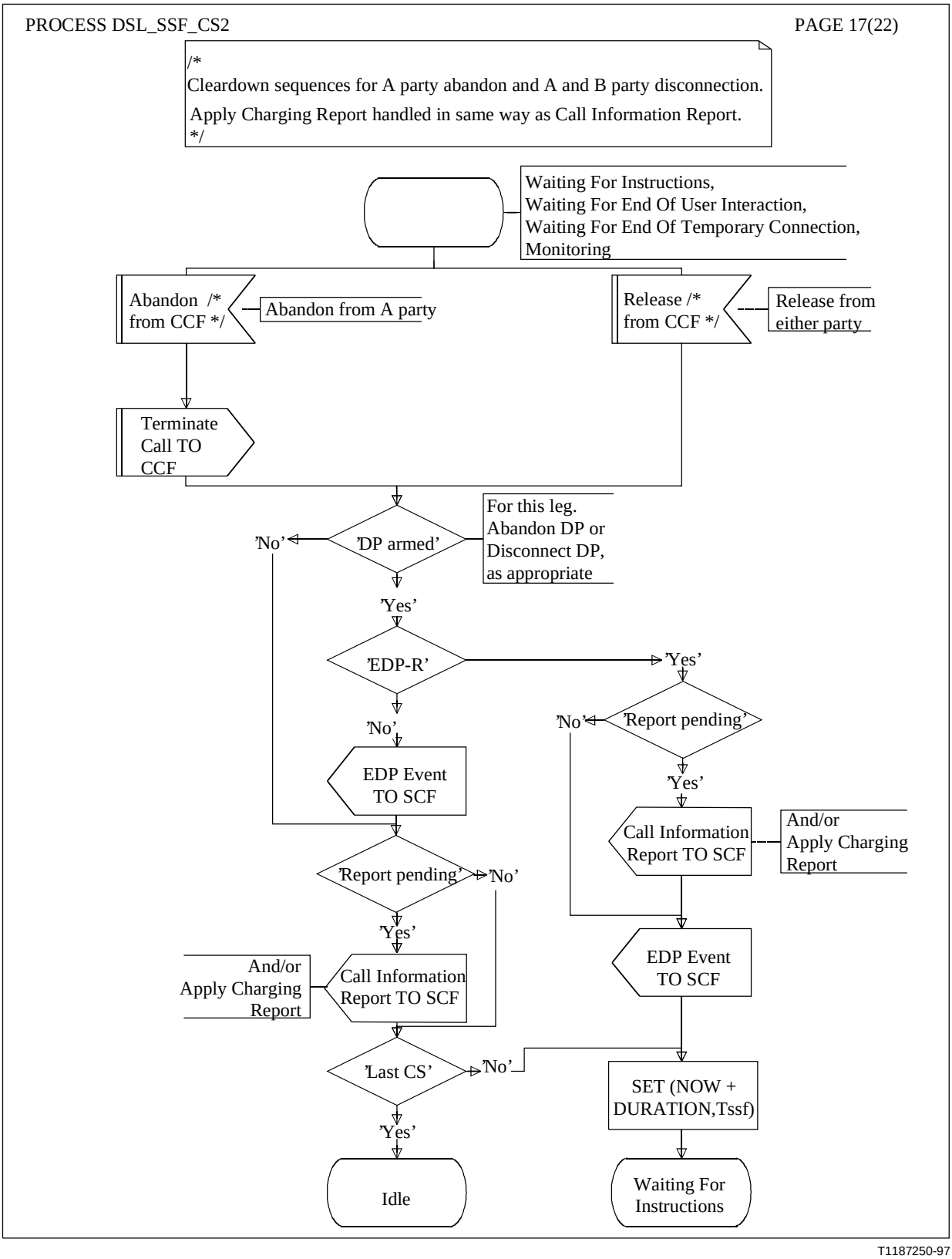

Figure 11-109/Q.1224 (sheet 17 of 22) – Distributed service logic for SSF FE

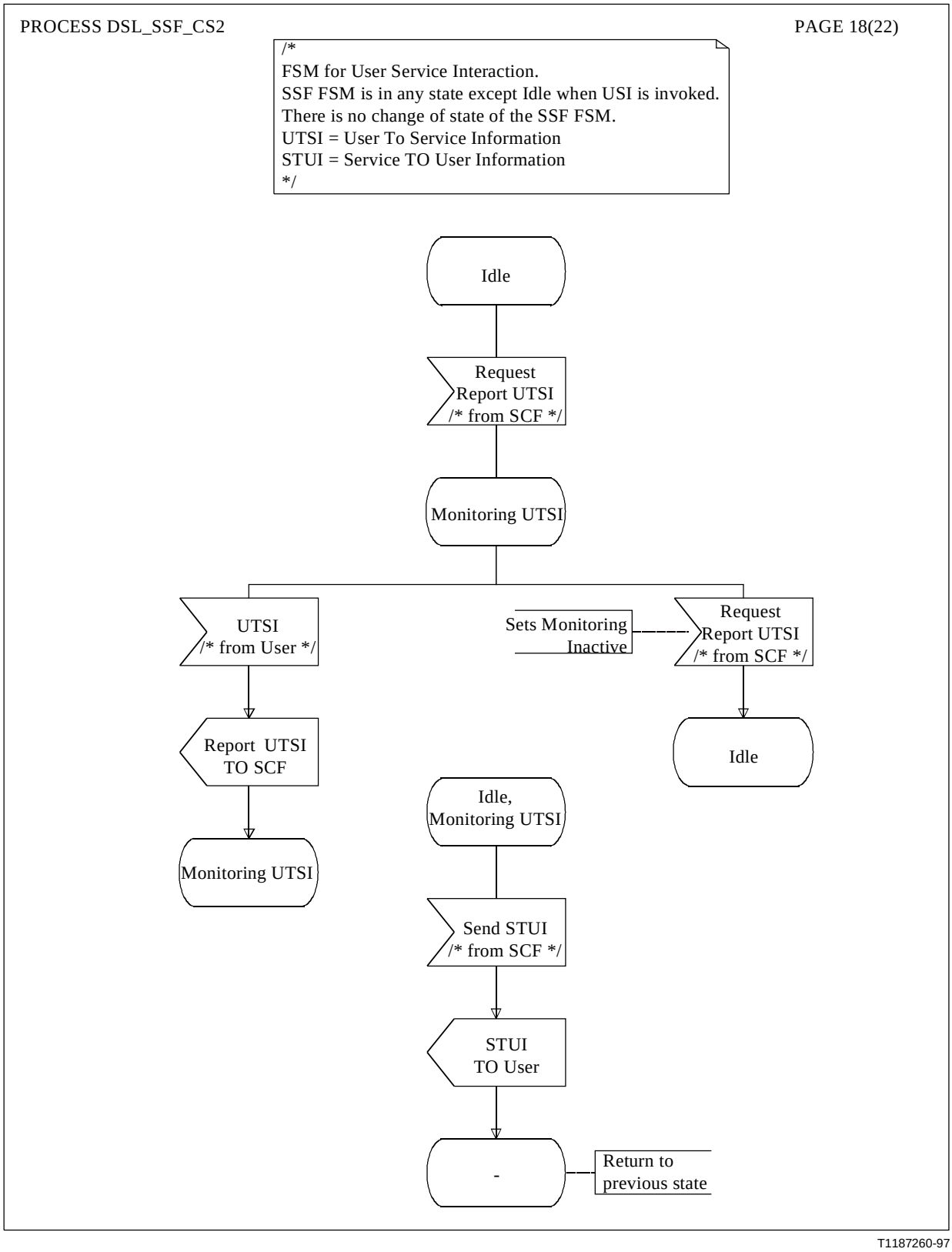

Figure 11-109/Q.1224 (sheet 18 of 22) – Distributed service logic for SSF FE

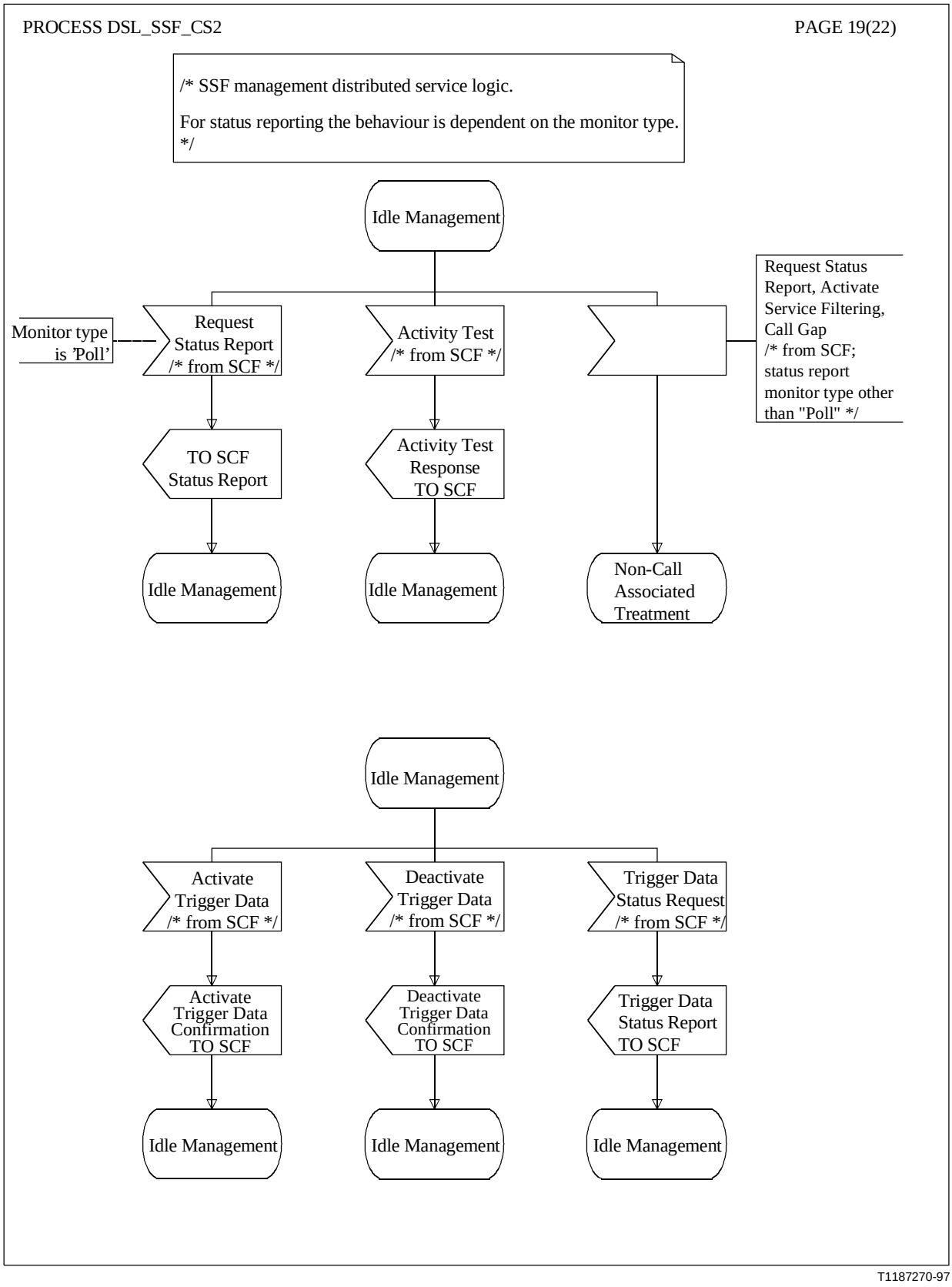

Figure 11-109/Q.1224 (sheet 19 of 22) – Distributed service logic for SSF FE

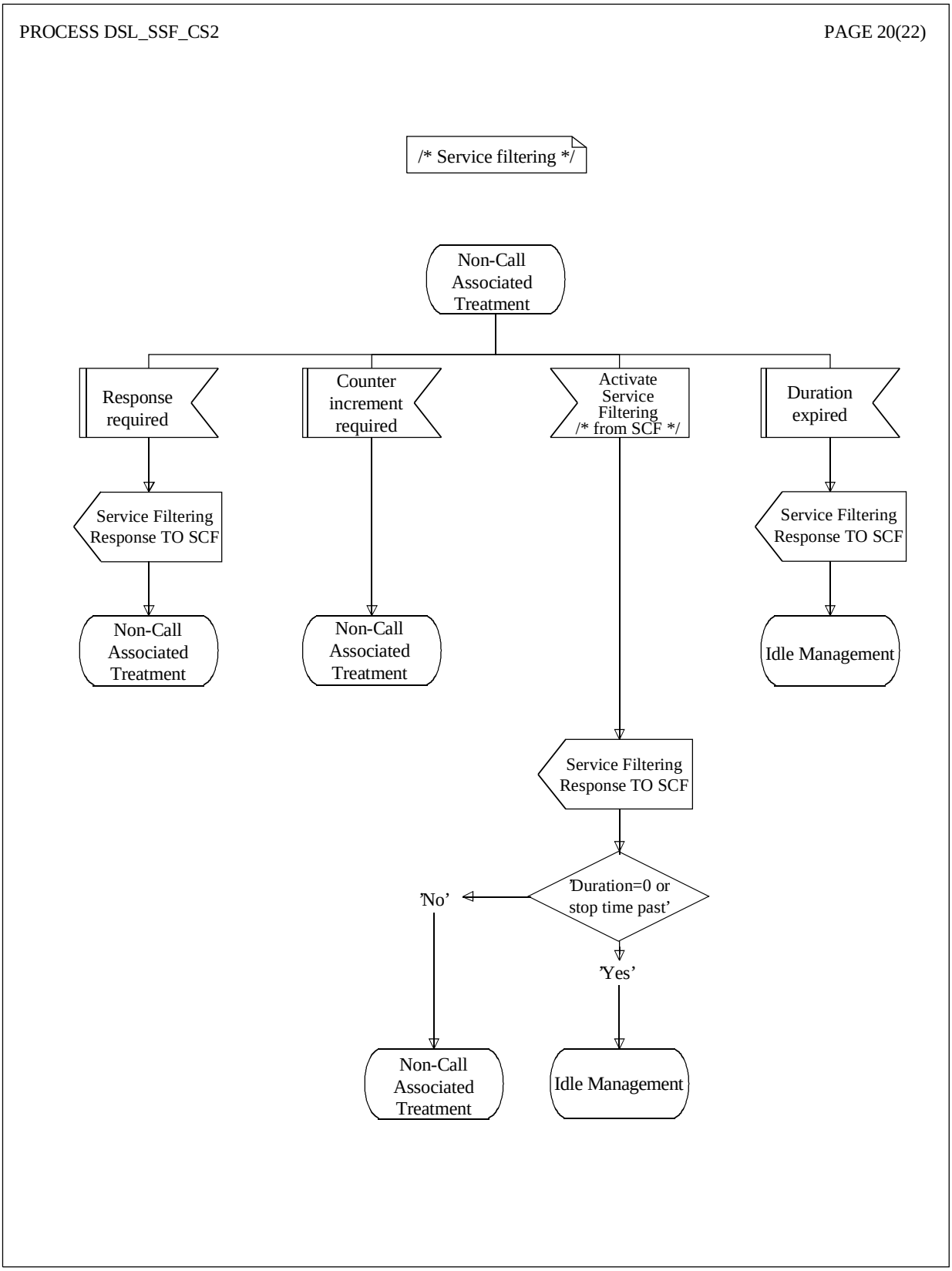

Figure 11-109/Q.1224 (sheet 20 of 22) – Distributed service logic for SSF FE

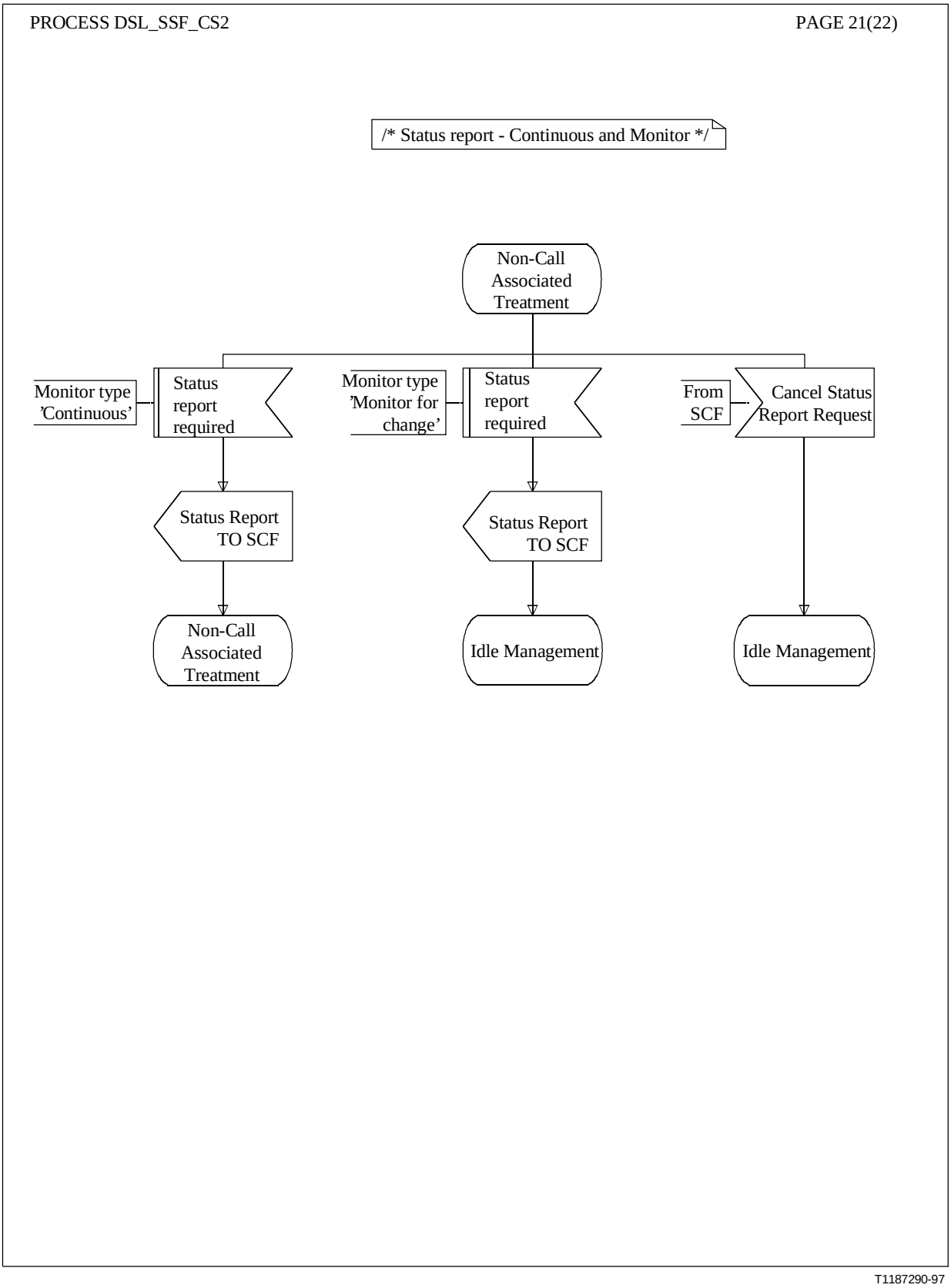

Figure 11-109/Q.1224 (sheet 21 of 22) – Distributed service logic for SSF FE

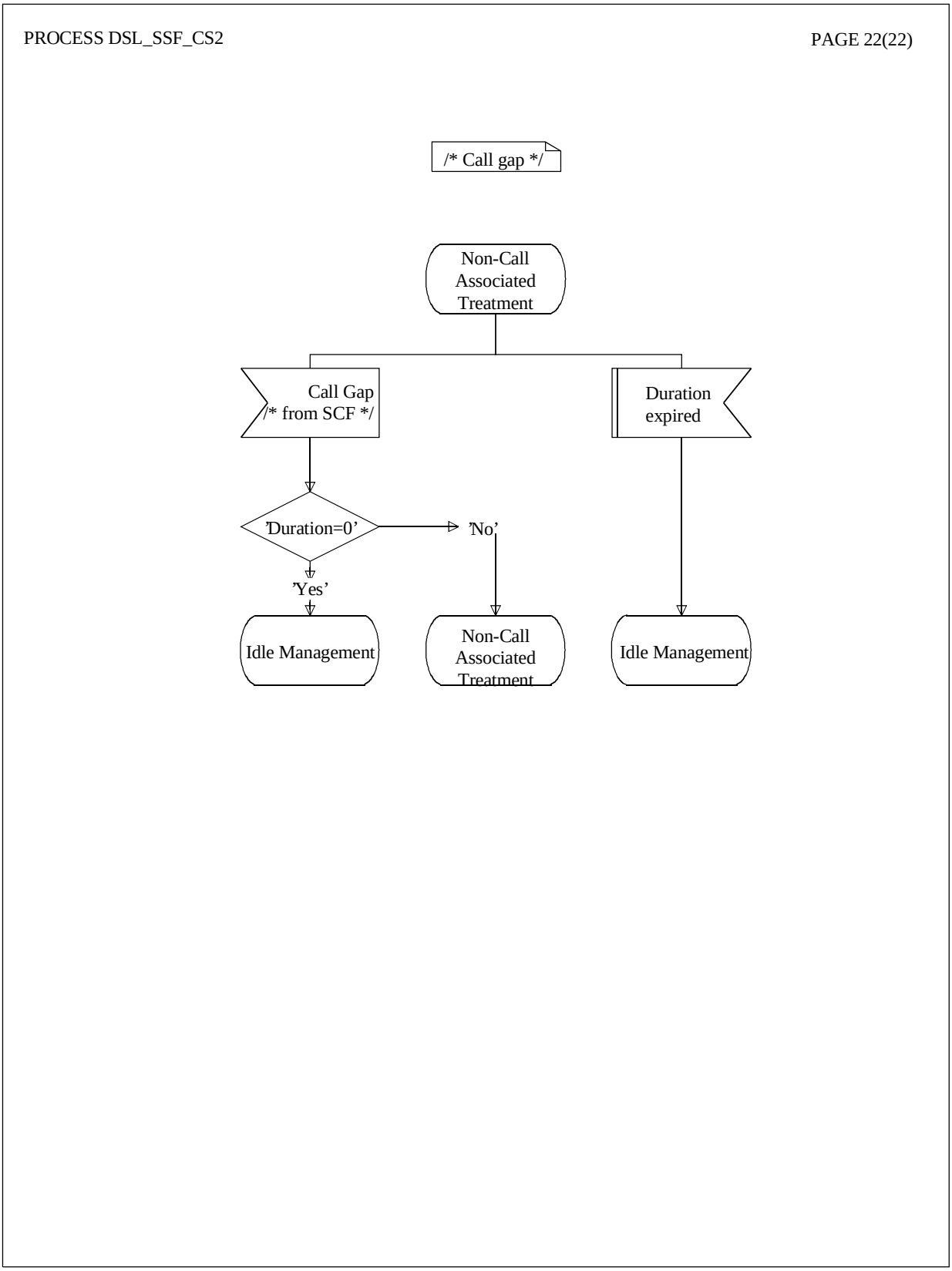

Figure 11-109/Q.1224 (sheet 22 of 22) – Distributed service logic for SSF FE

11.5.3 Distributed service logic for assist/handoff SSF

Figure 11-110 contains the SDL diagrams describing the distributed service logic for the assist/handoff SSF.

PROCESS DSL_Assist_Handoff_SSF PAGE 1(7)

```
/*
Distributed service logic for Assist/Handoff SSF
Based on  clause 11, Q.1228.
*/
```

```
/* The discussion of the possible values of Tssf is identical with that
given in the distributed service logic diagrams for the SSF.
*/
```

```
/* Local signal definitions.
These signals to and from the CCF are internal indications which are
not defined in the IN CS-2 Recommendations. The names are therefore
local names only.*/

/* From CCF */
SIGNAL Assist Required, Backward Connection Released,
Forward Connection Released;

/* To CCF */

SIGNAL Connect SRF, Route To Default, SRF Release Request,
Terminate Call;

/* Indication from SRF representing bearer signalling release request */
SIGNAL Release Request From SRF;
```

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Figure 11-110/Q.1224 (sheet 1 of 7) – Distributed service logic for assist/handoff SSF FE

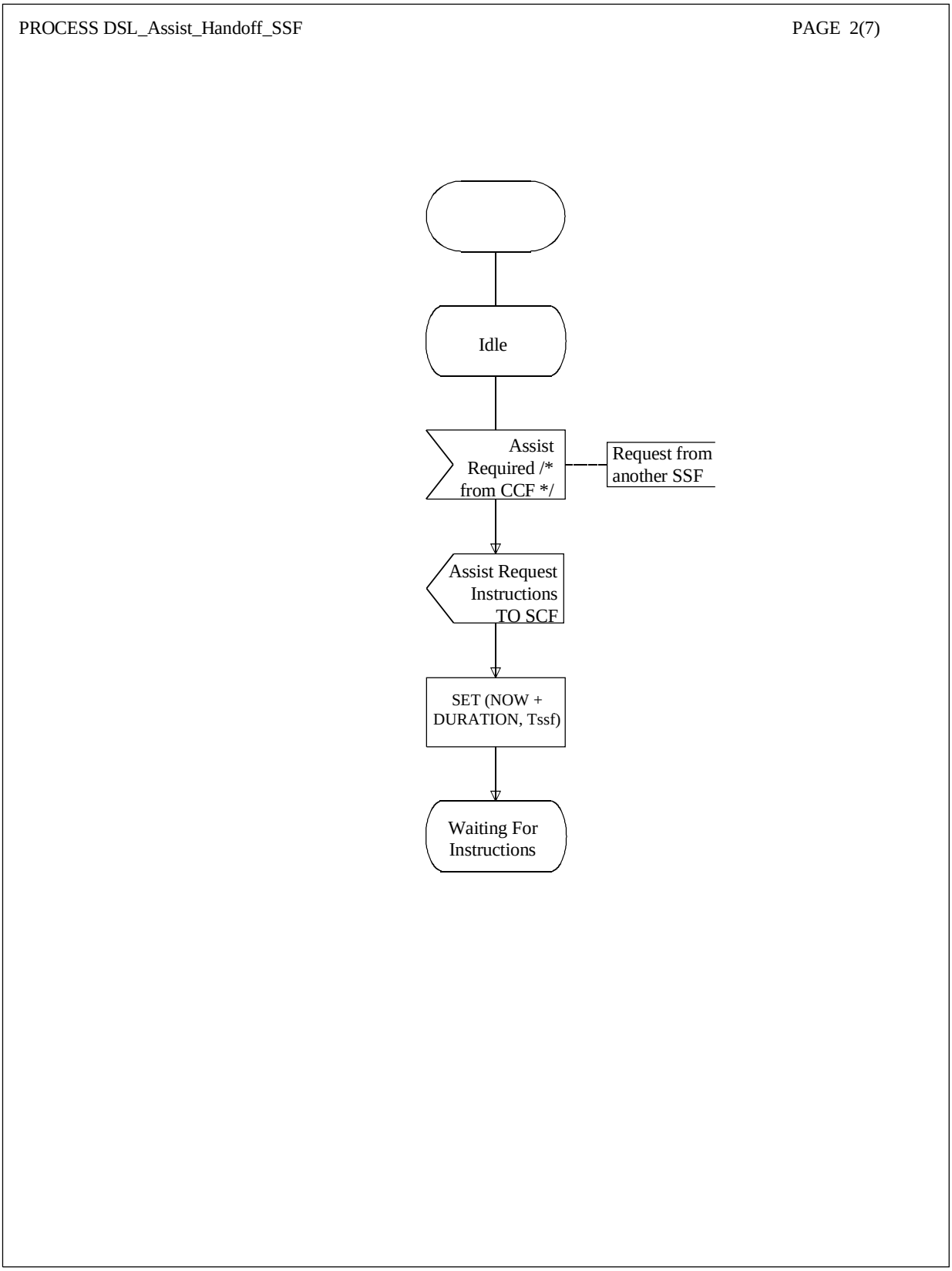

Figure 11-110/Q.1224 (sheet 2 of 7) – Distributed service logic for assist/handoff SSF FE

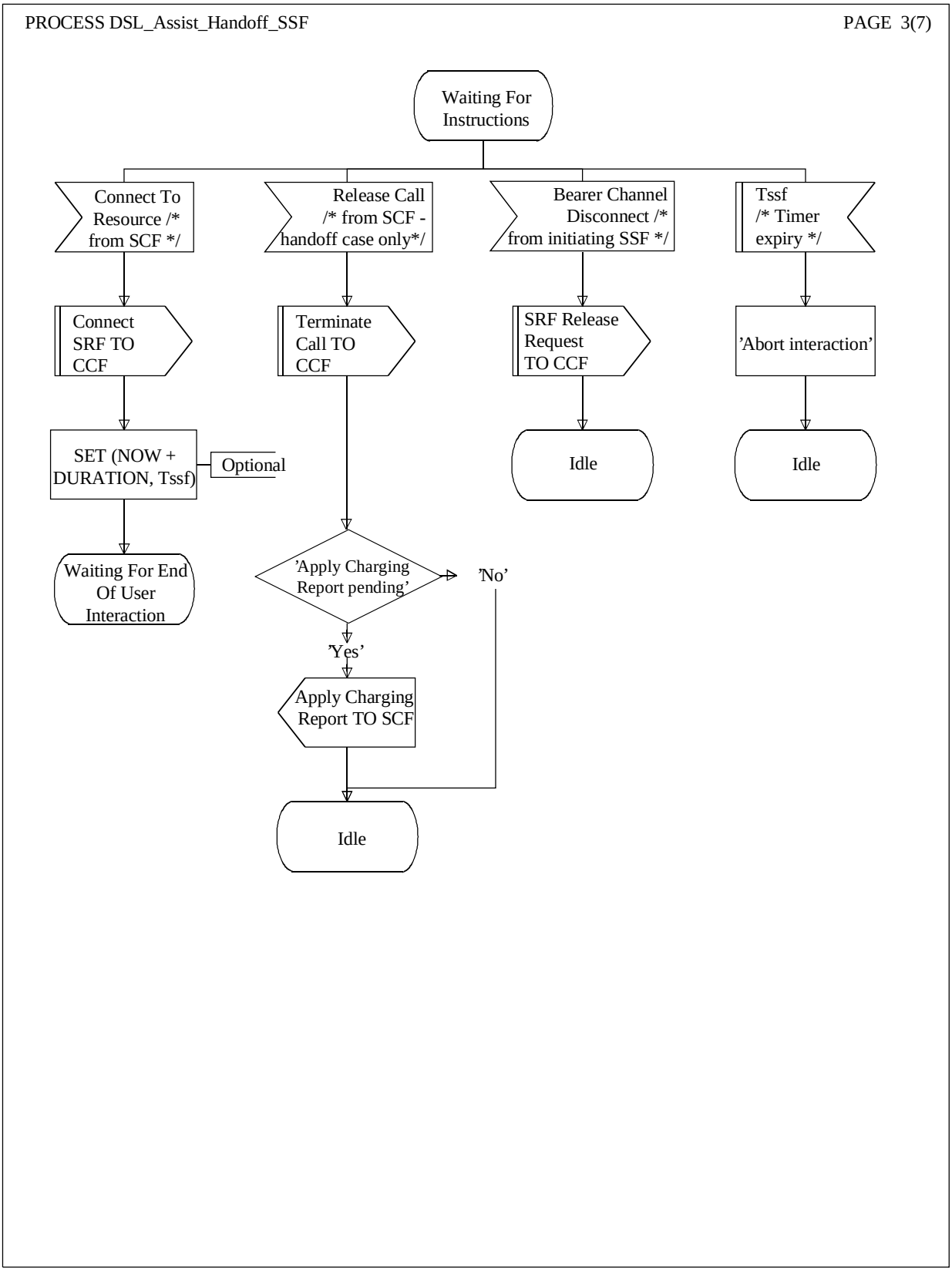

Figure 11-110/Q.1224 (sheet 3 of 7) – Distributed service logic for assist/handoff SSF FE

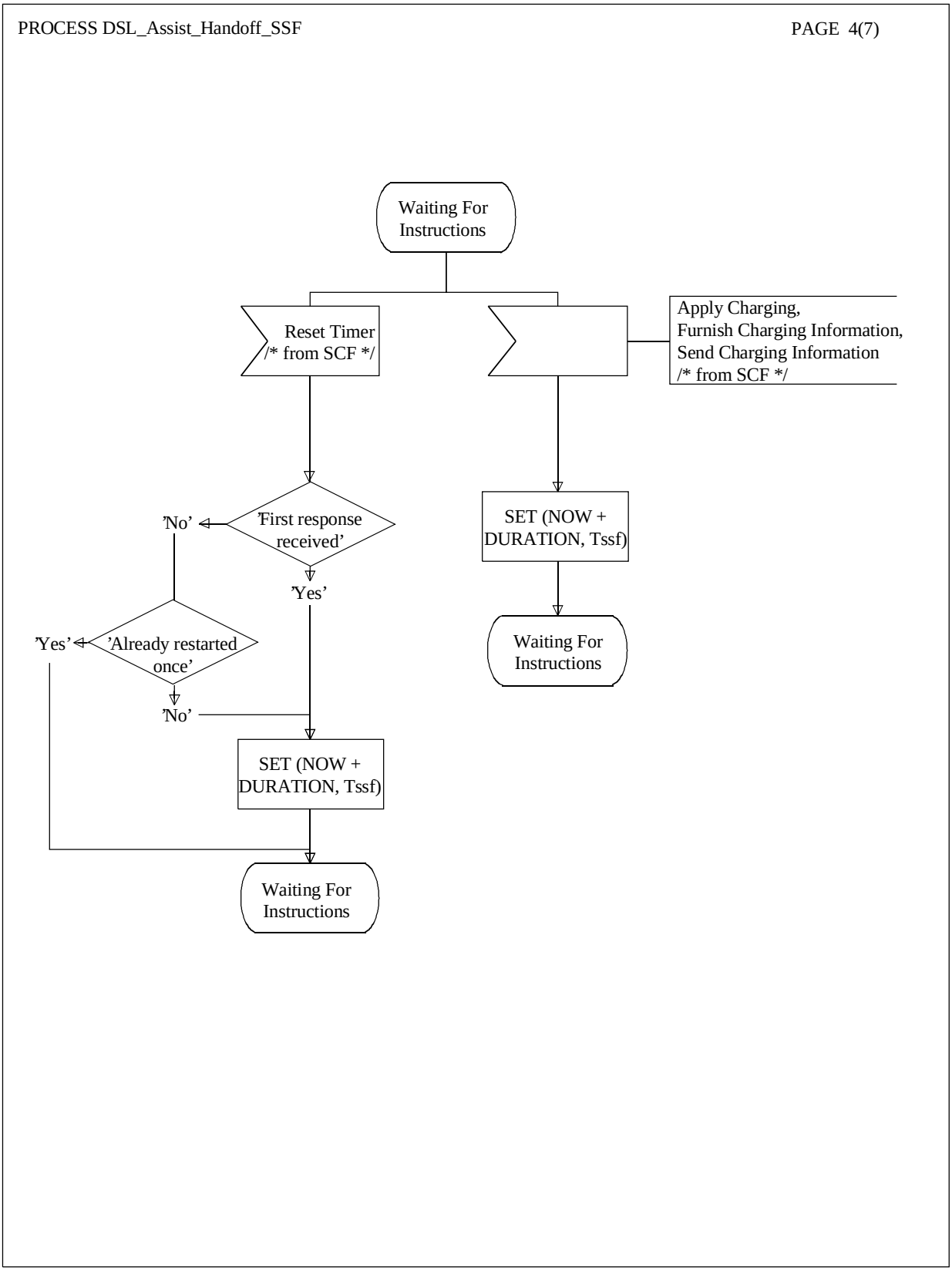

Figure 11-110/Q.1224 (sheet 4 of 7) – Distributed service logic for assist/handoff SSF FE

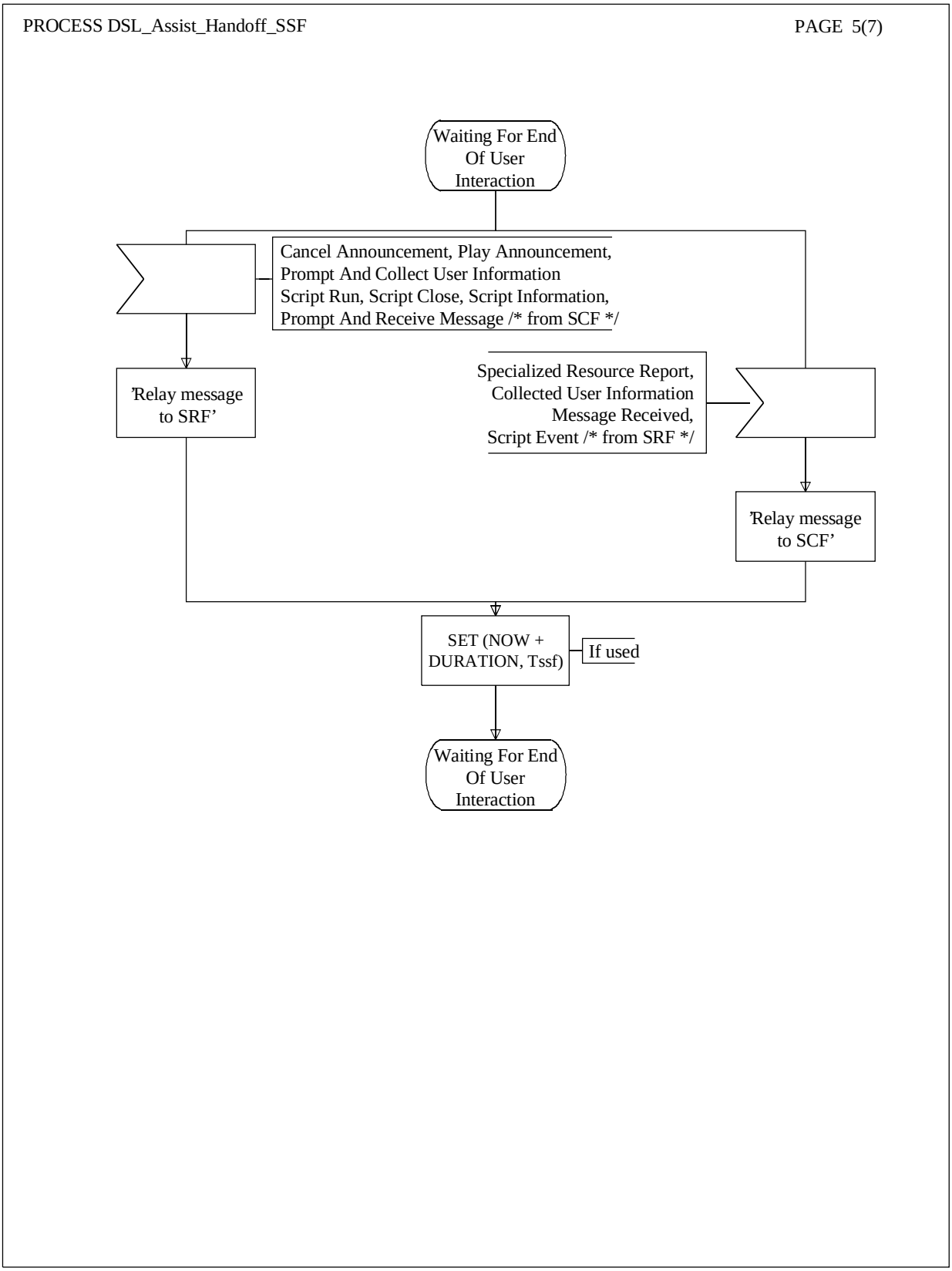

Figure 11-110/Q.1224 (sheet 5 of 7) – Distributed service logic for assist/handoff SSF FE

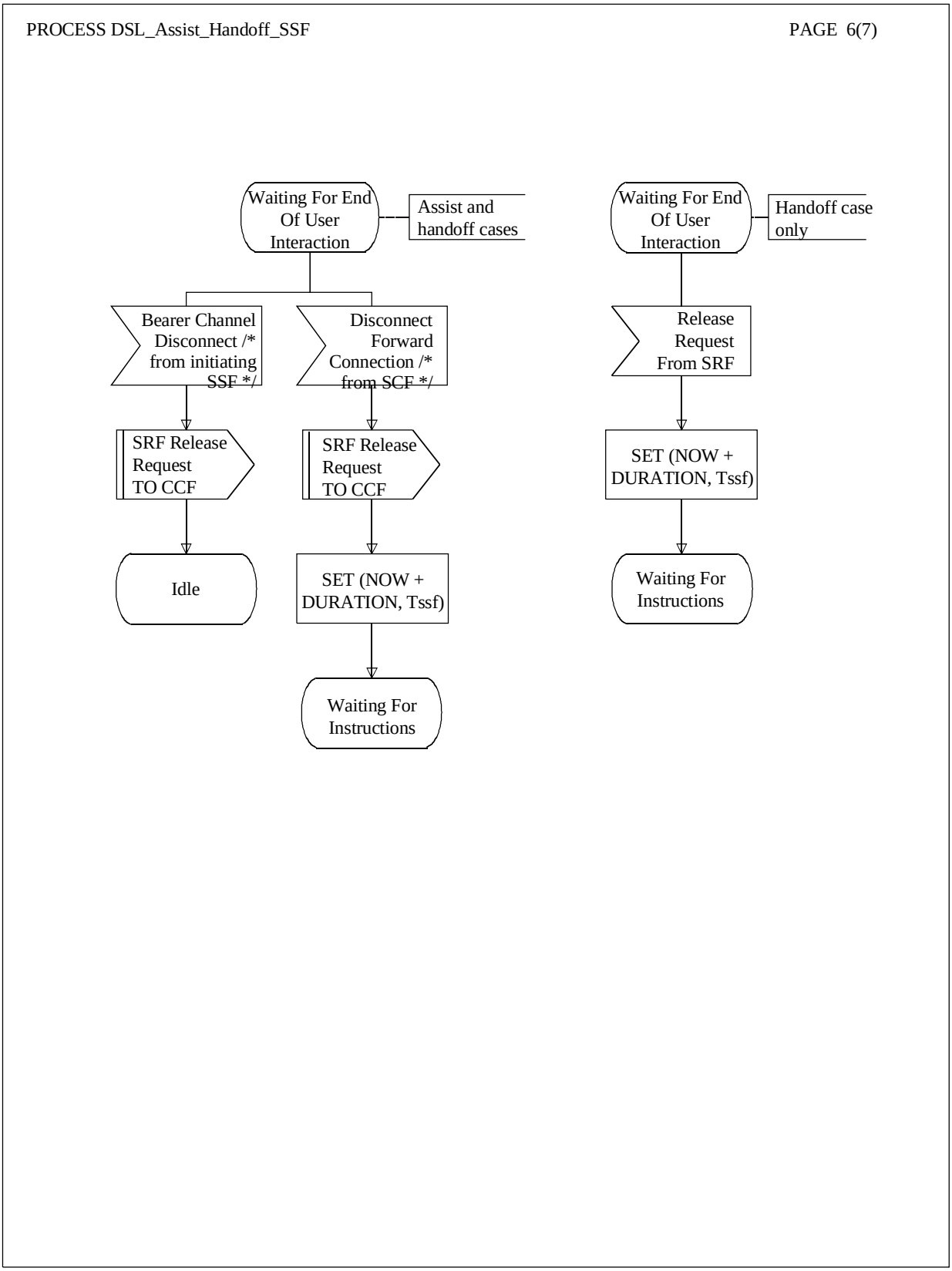

Figure 11-110/Q.1224 (sheet 6 of 7) – Distributed service logic for assist/handoff SSF FE

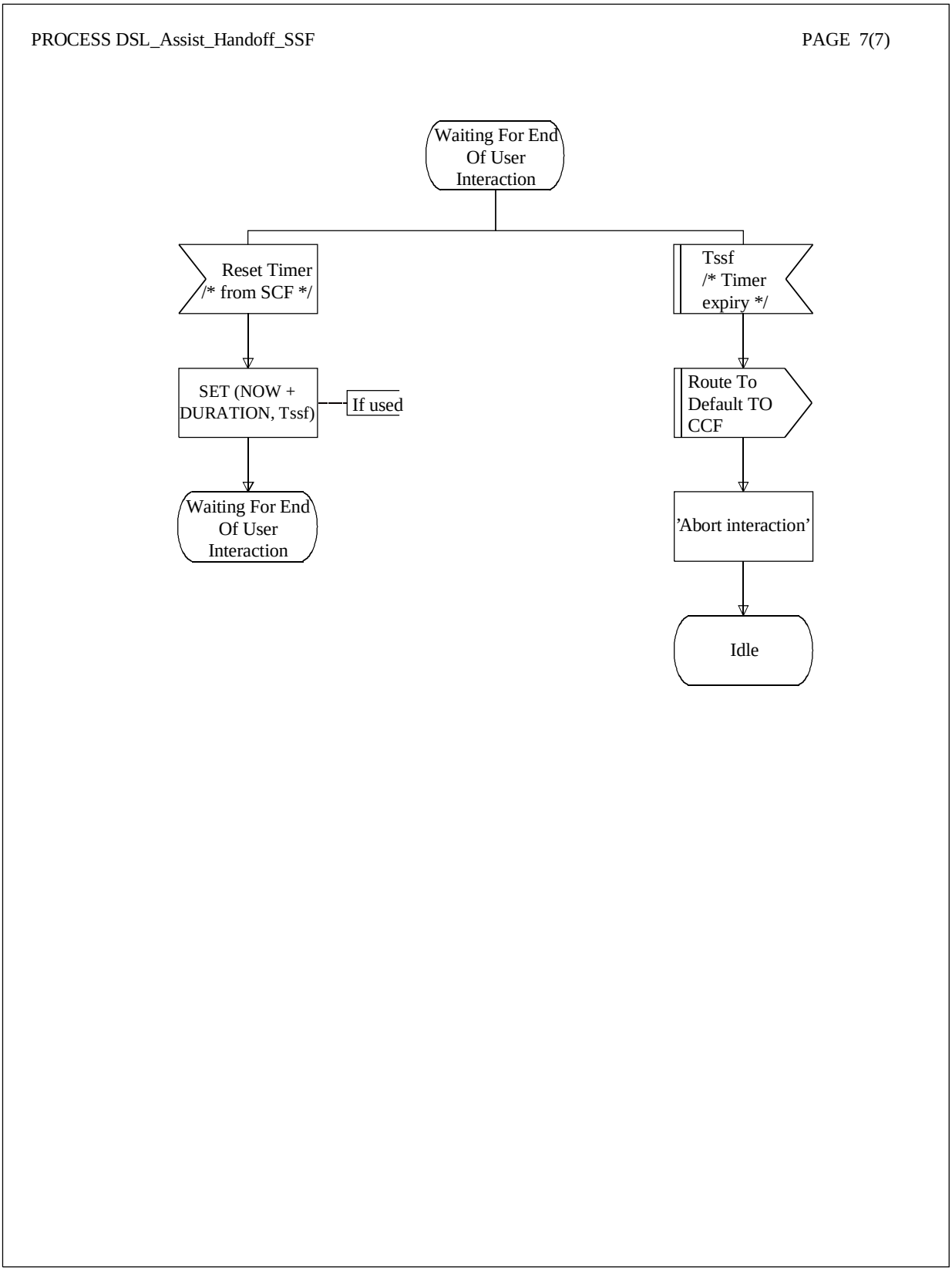

Figure 11-110/Q.1224 (sheet 7 of 7) – Distributed service logic for assist/handoff SSF FE

11.5.4 Distributed service logic for SRF

Figure 11-111 contains the SDL diagrams describing the distributed service logic for the SRF.

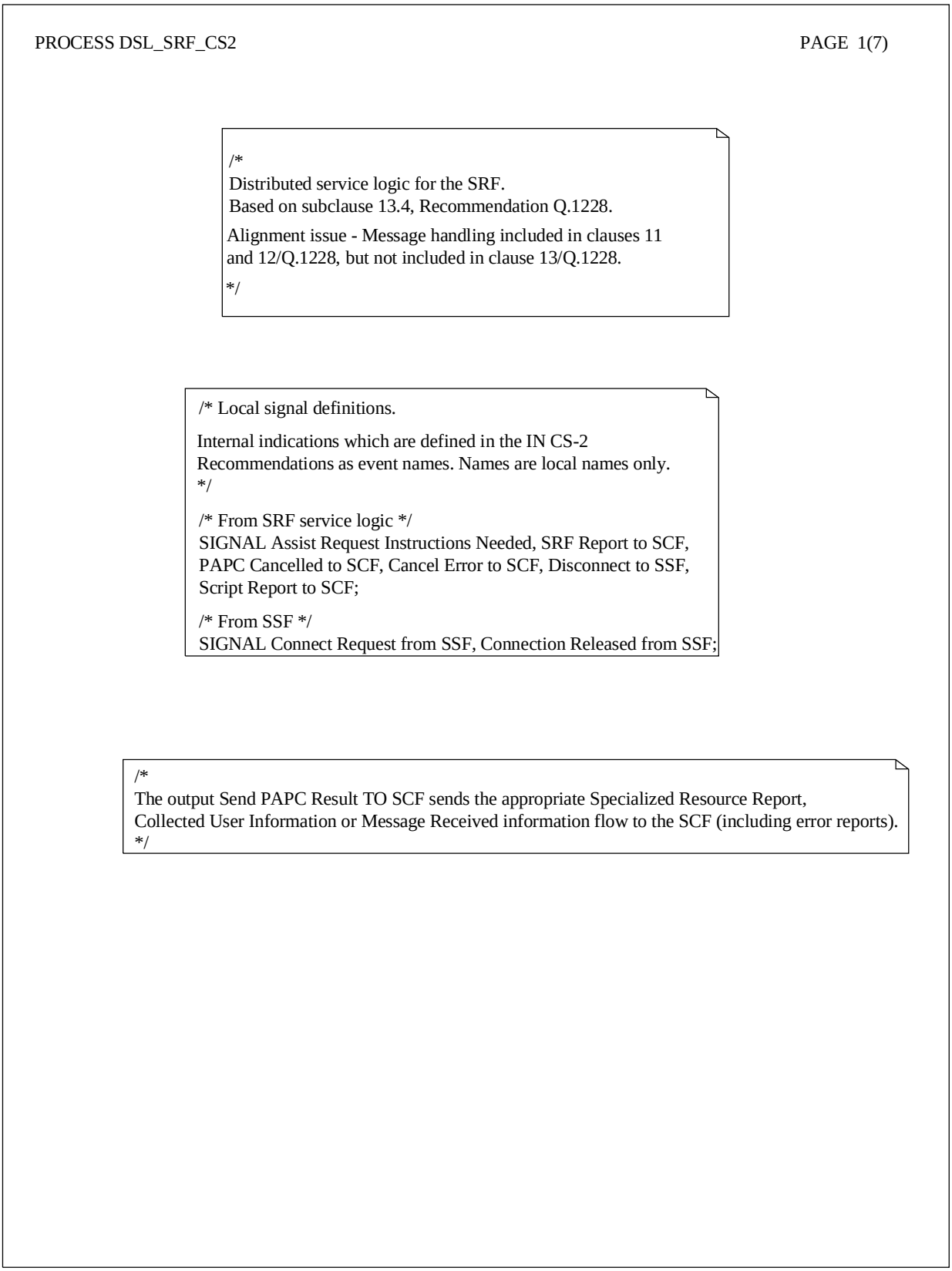

Figure 11-111/Q.1224 (sheet 1 of 7) – Distributed service logic for SRF FE

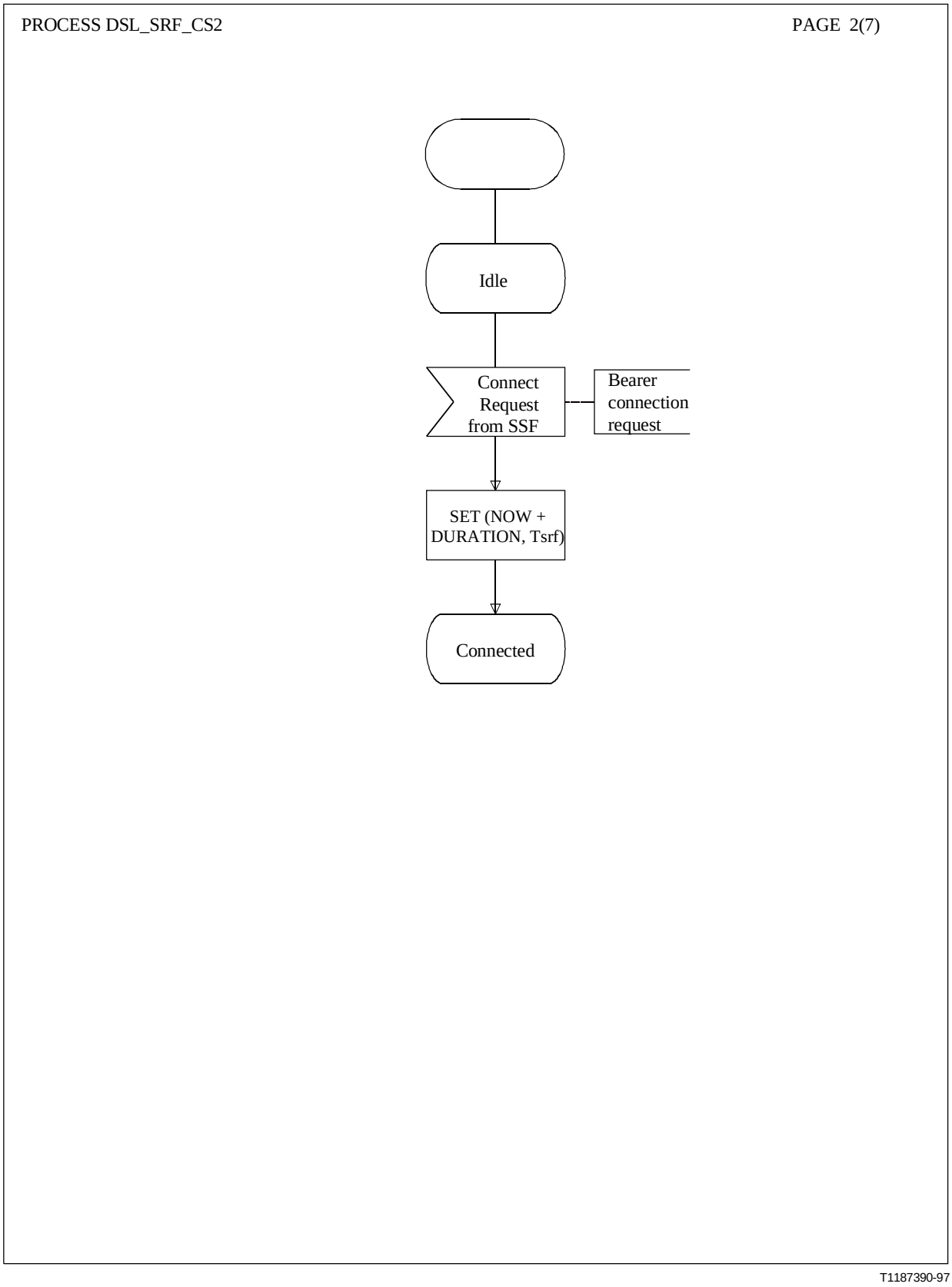

Figure 11-111/Q.1224 (sheet 2 of 7) – Distributed service logic for SRF FE

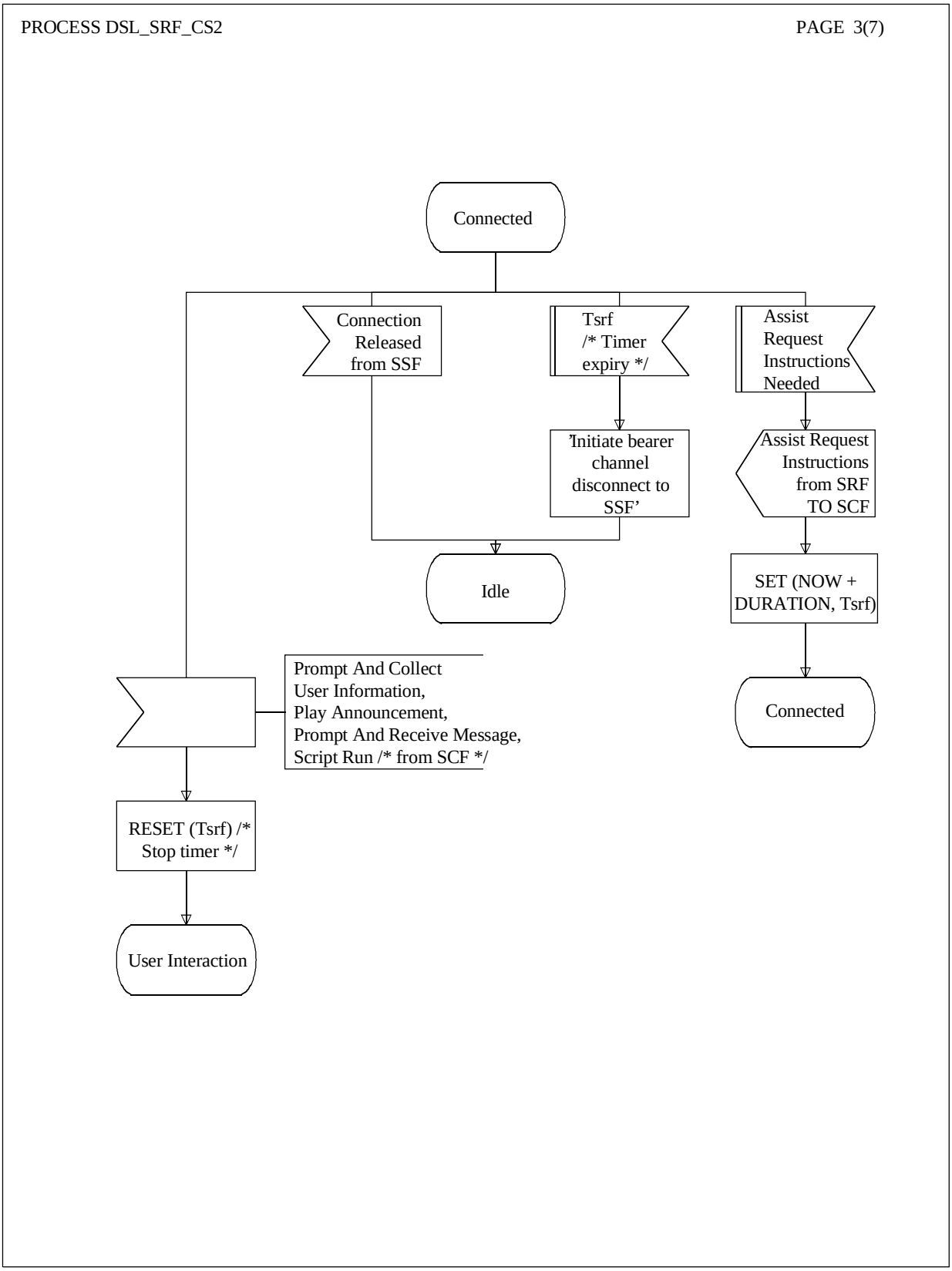

Figure 11-111/Q.1224 (sheet 3 of 7) – Distributed service logic for SRF FE

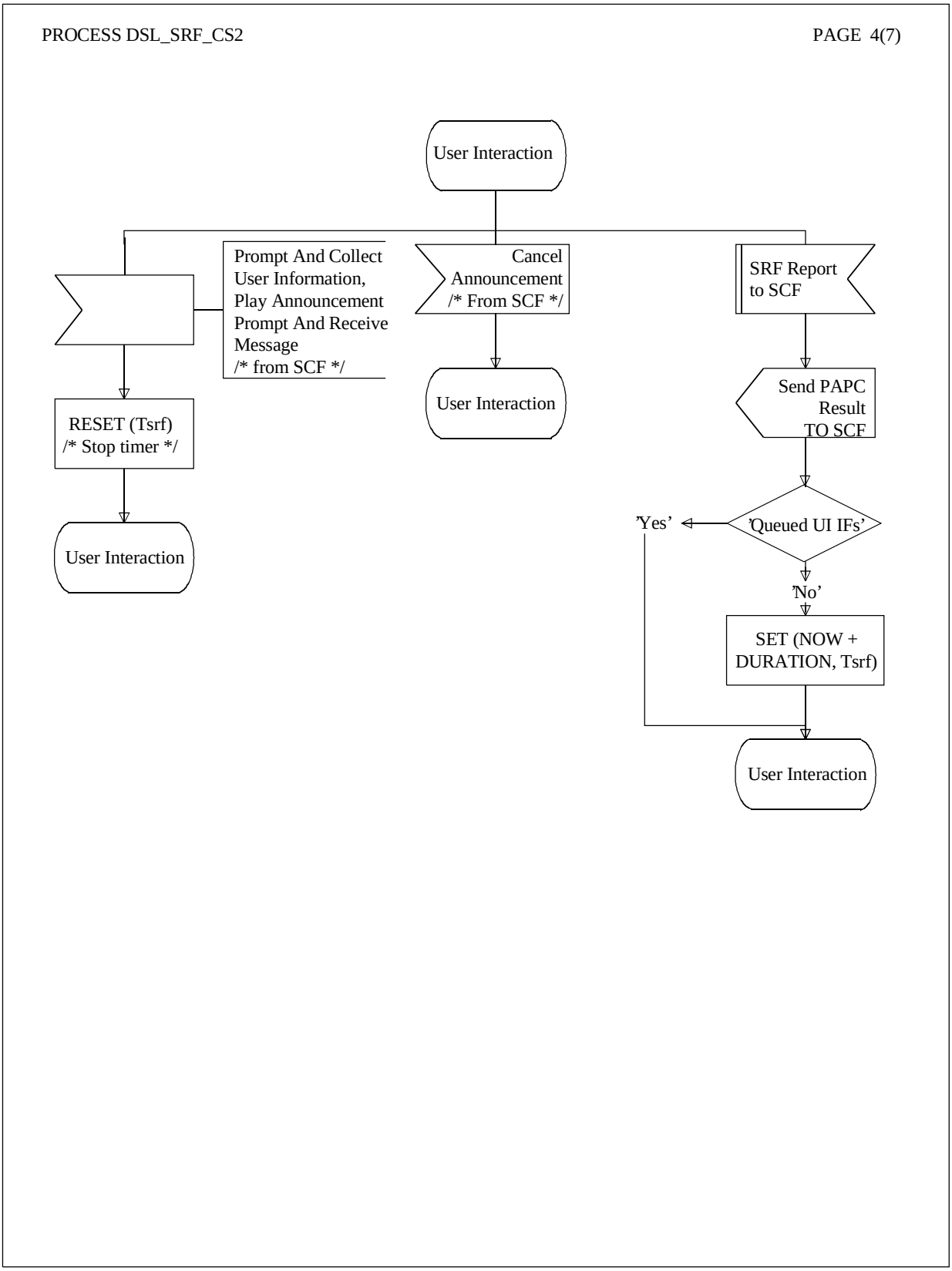

Figure 11-111/Q.1224 (sheet 4 of 7) – Distributed service logic for SRF FE

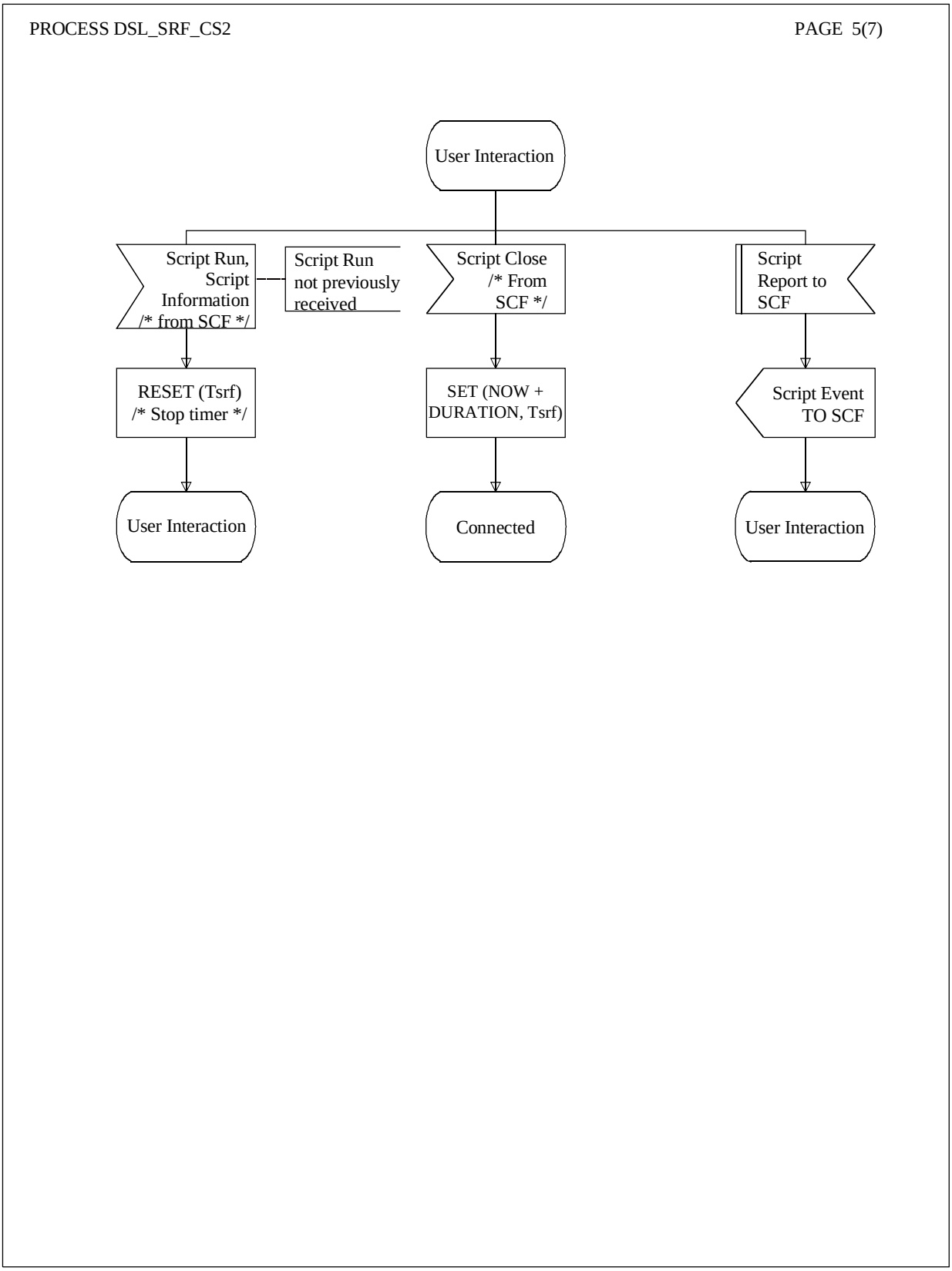

Figure 11-111/Q.1224 (sheet 5 of 7) – Distributed service logic for SRF FE

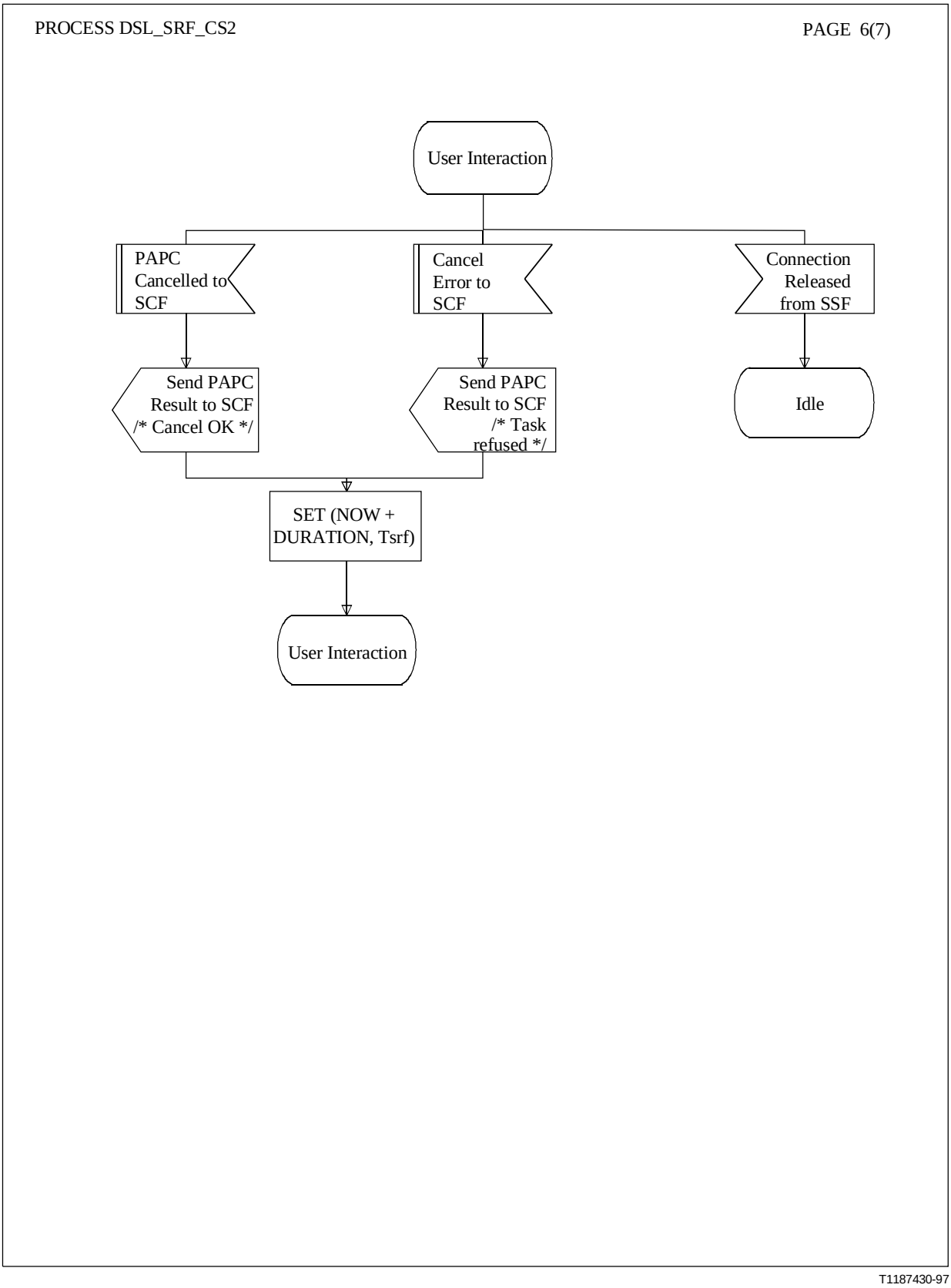

Figure 11-111/Q.1224 (sheet 6 of 7) – Distributed service logic for SRF FE

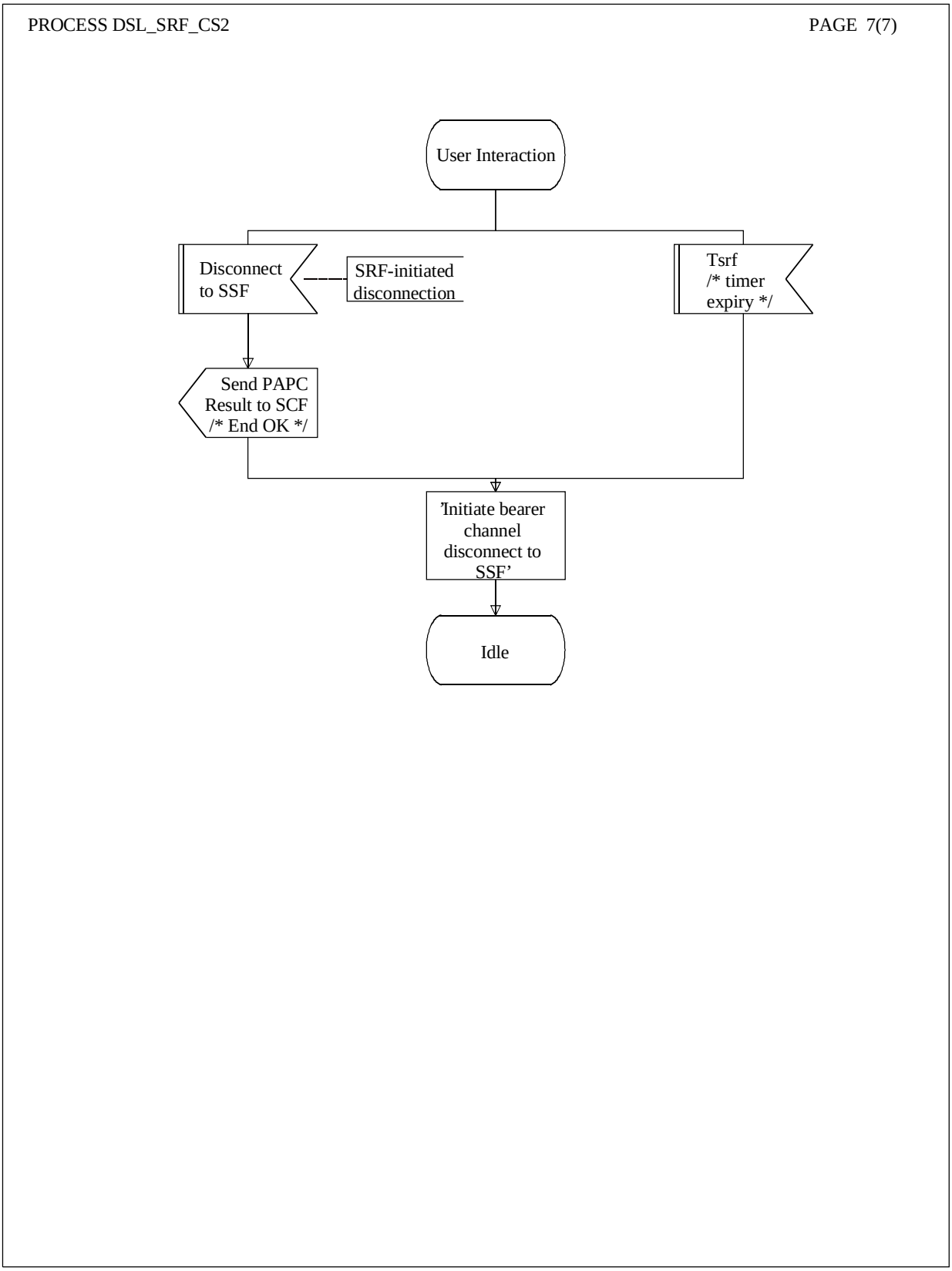

Figure 11-111/Q.1224 (sheet 7 of 7) – Distributed service logic for SRF FE

11.5.5 Distributed service logic for SCF

Figure 11-112 contains the SDL diagrams describing the distributed service logic for the SCF. The SDL diagrams describing the distributed service logic for the SCF-SCF interaction are contained in Figure 11-113 for the controlling SCF and Figure 11-114 for the supporting SCF, including chaining.

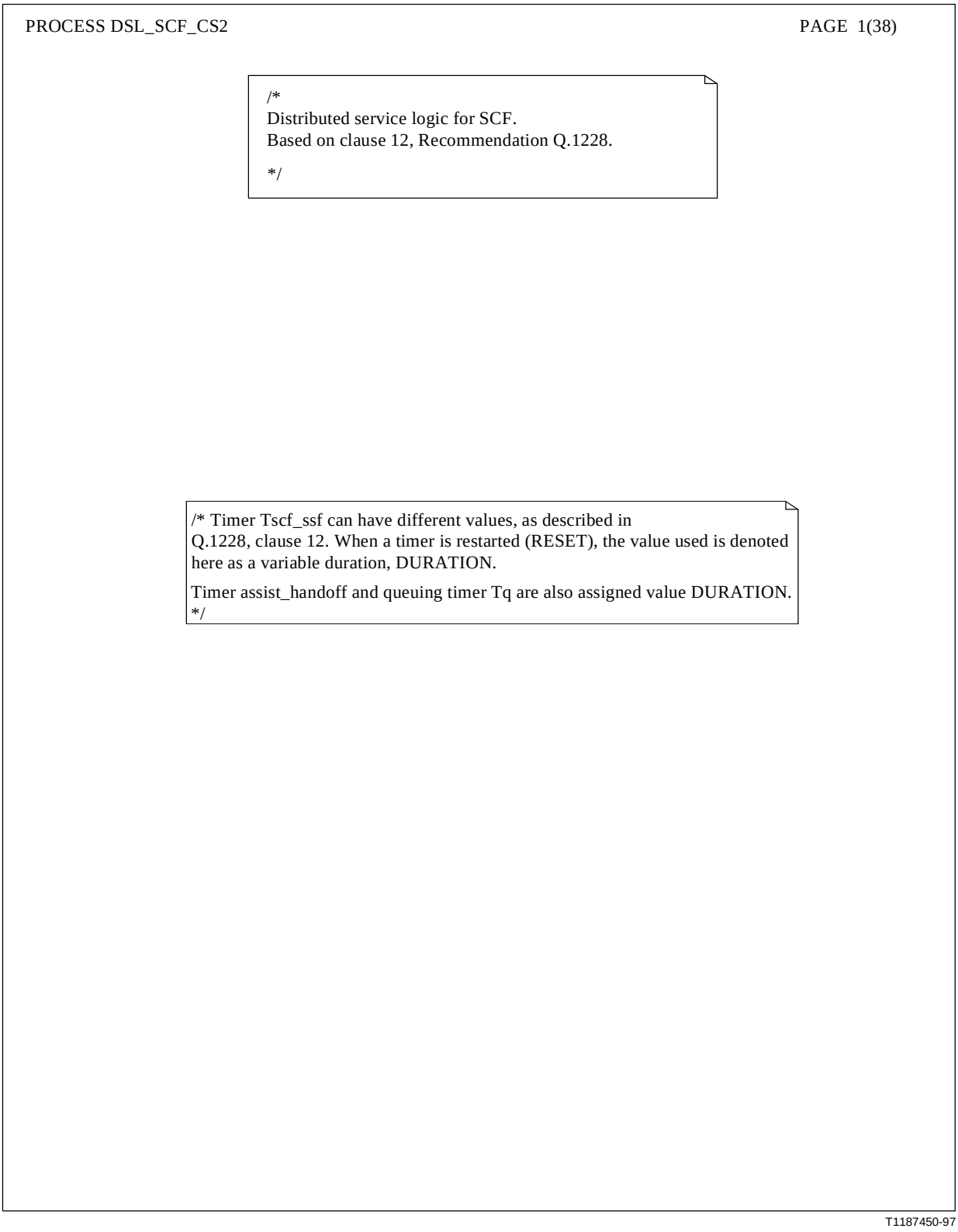

Figure 11-112/Q.1224 (sheet 1 of 38) – Distributed service logic for SCF FE

```
/* Local signal definitions - first part.
Signals from (internal) SCF logic.
 */
/* From SCF service logic */
SIGNAL SL Invocation, Non-Call Processing Instructions, SR Facilities Needed,
Call Processing Instruction Ready (no-mon.), Call Processing Instruction Ready (mon.),
Ready for Queuing Processing, Processing Failure,
Assist Needed, Hand off Needed, Continue SCF Processing, Cancellation Required,
Last CS or Leg instr., Continuing CS or Leg instr., Request Rept. Facility Event reqd.
Facility or non-call proc. instr., Connect To Resource needed, Request to SRF,
Final request with resp. reqd., Final request with no resp. reqd., Processing Completed;
```

```
/* Local signal definitions - first part continued */

/* From SCF service logic */
SIGNAL Busy Line/Trunk, Idle Line/Trunk, Notification or Request Continuing Instruction,
Monitoring Cancel Instruction, Release Call Instruction (rept. pending),
Release Call Instruction (no rept. pending), Not Last CS Event - EDP-N,
Last CS Event - EDP-N, CUSF Initiate Control Requested, Event Request,
Request Send Comp. (no mon.),  Request Send Comp. (mon. reqd.),
Request Release Association reqd., Request Monitor UTSI reqd.,
Request Send STUI reqd., End Monitor UTSI reqd.;

/* Generic information flow - indicates that some failure is to
be reported to the SSF. */
SIGNAL Exception;
```

```
/* Local signal definitions - second part.
Signals to and from external FEs. */

/* LocaL name to indicate selection from a list of information flows
named in a comment attached to the symbol */
SIGNAL Inf. Flow;

/* Local names defined for signals SSF to SCF */
SIGNAL TDP Event; /* Indicates one of Initial DP or a DP-specific operation */
SIGNAL EDP Event; /* Indicates one of Event Report BCSM or a DP-specific operation */

/* To SSF */
SIGNAL Exception;

/* From SSF */
SIGNAL Abort from SSF;

/* From SRF */
SIGNAL Failure from SRF;
```

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Figure 11-112/Q.1224 (sheet 2 of 38) – Distributed service logic for SCF FE

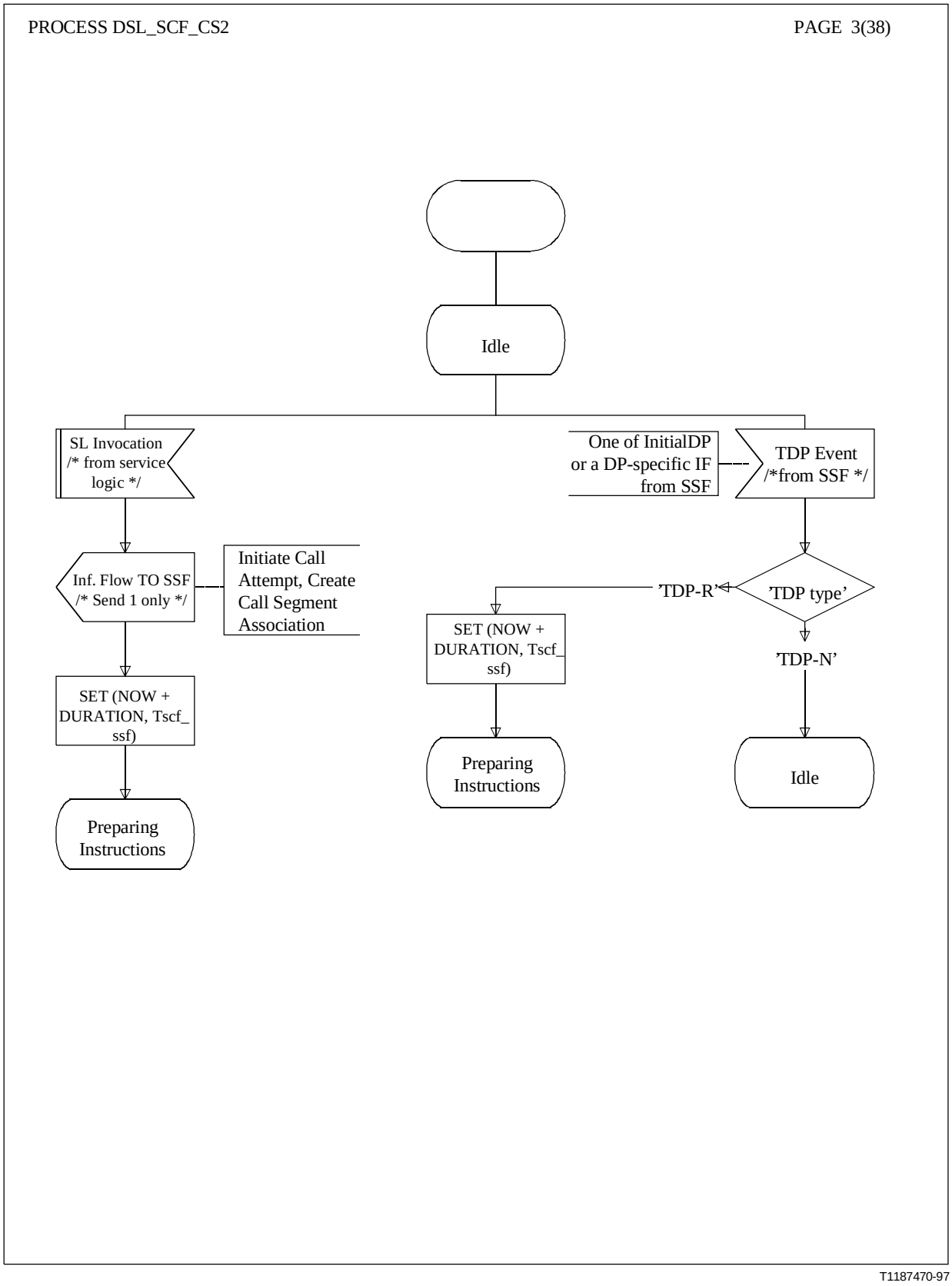

Figure 11-112/Q.1224 (sheet 3 of 38) – Distributed service logic for SCF FE

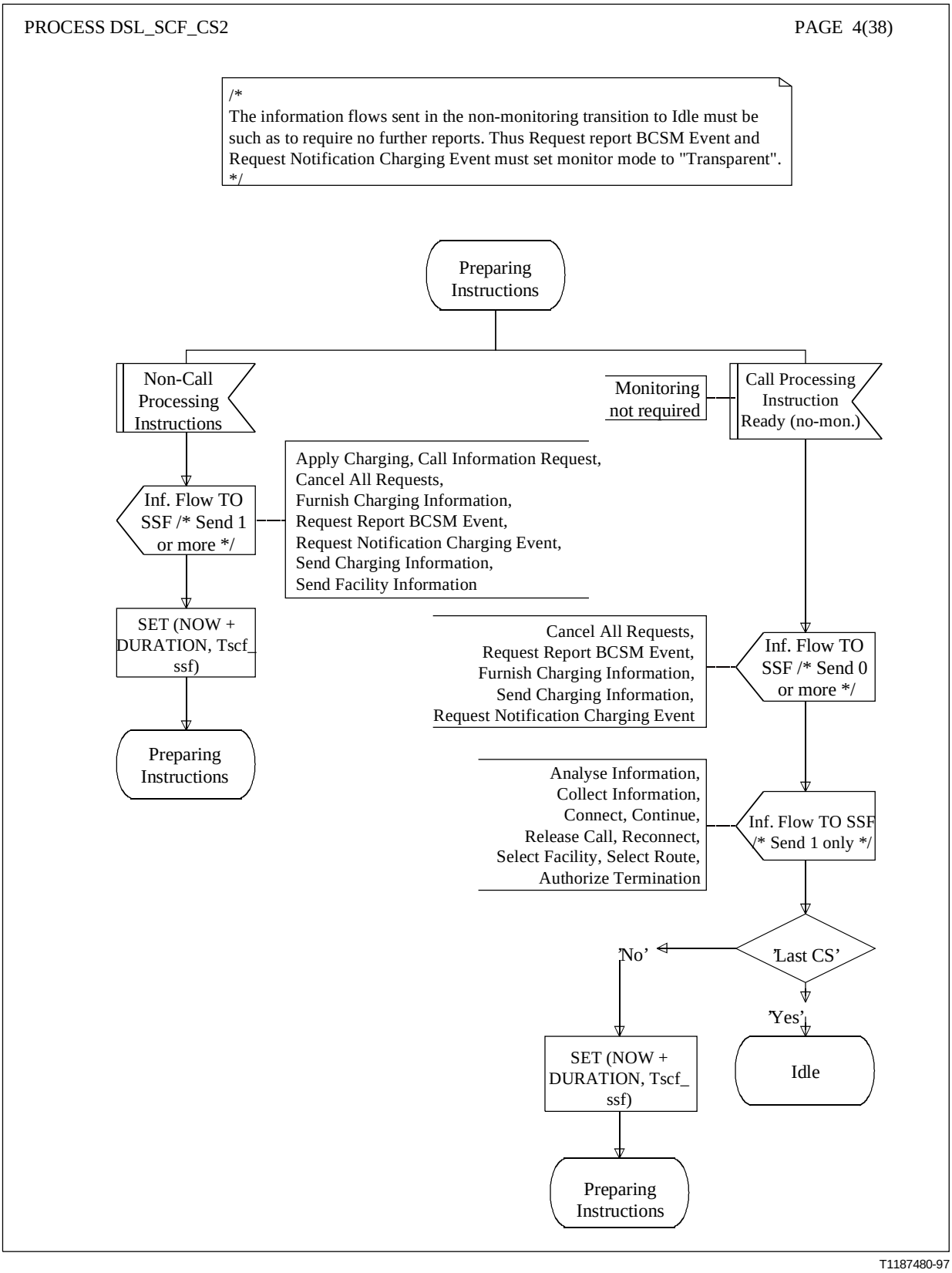

Figure 11-112/Q.1224 (sheet 4 of 38) – Distributed service logic for SCF FE

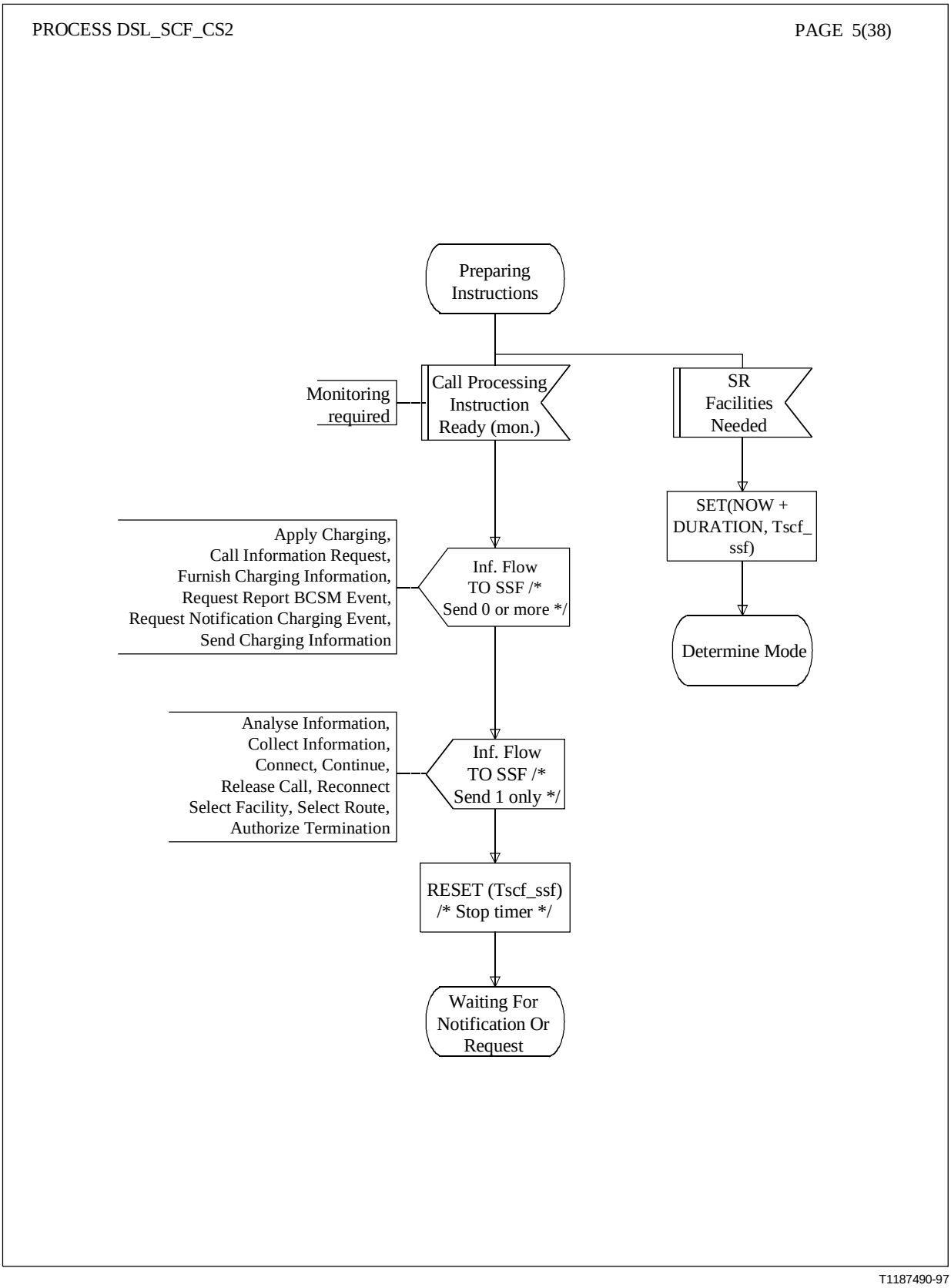

Figure 11-112/Q.1224 (sheet 5 of 38) – Distributed service logic for SCF FE

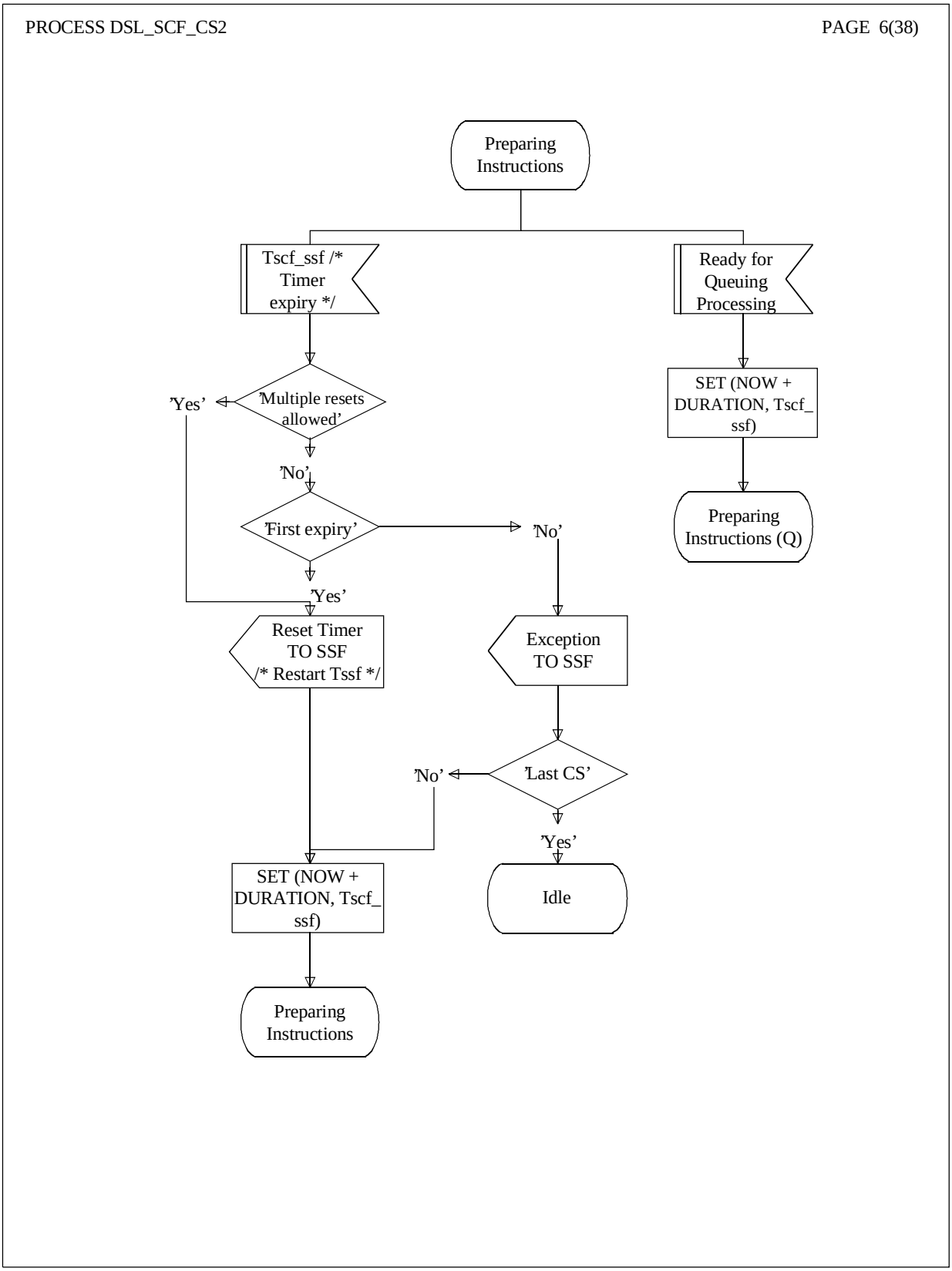

Figure 11-112/Q.1224 (sheet 6 of 38) – Distributed service logic for SCF FE

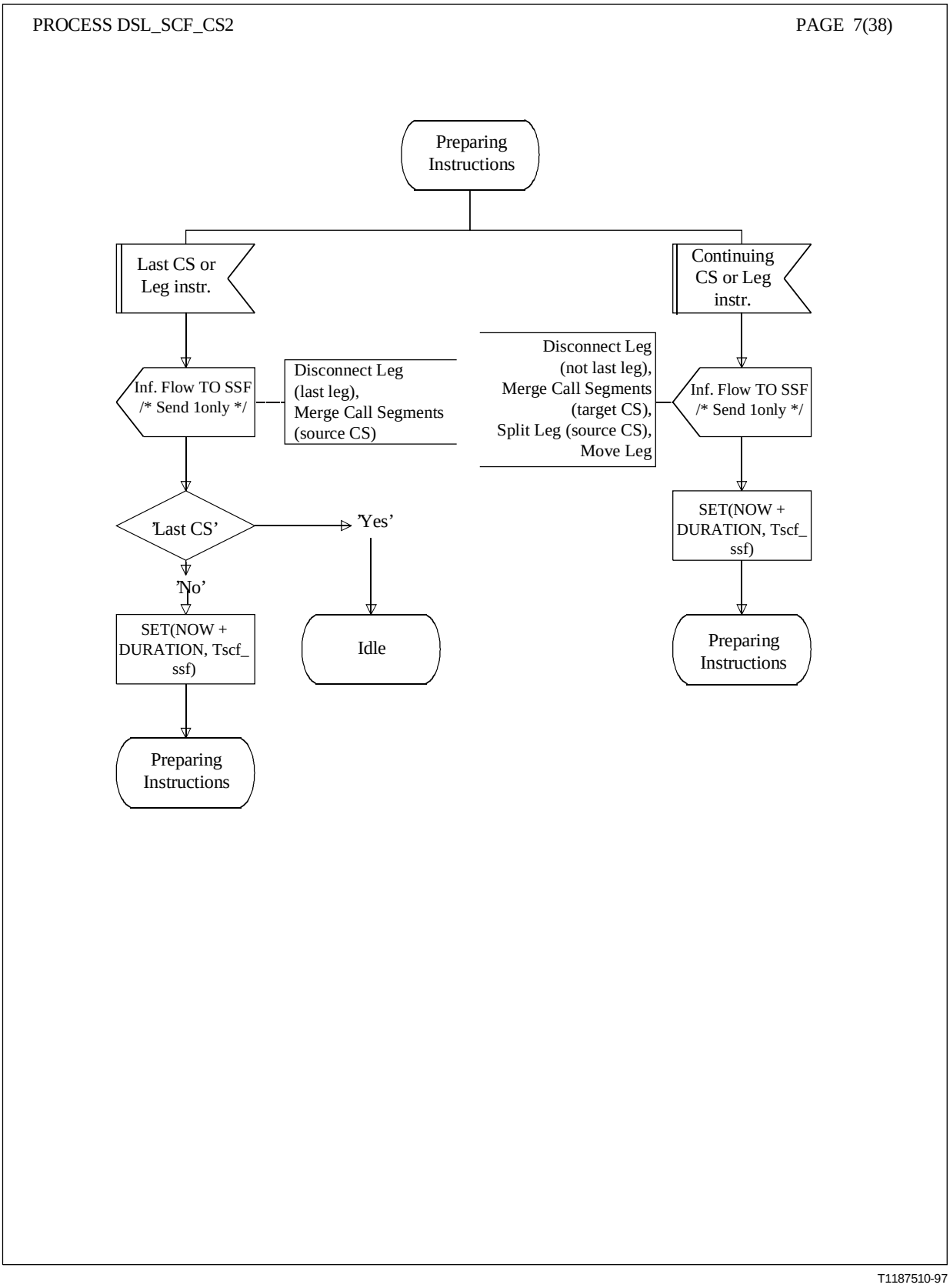

Figure 11-112/Q.1224 (sheet 7 of 38) – Distributed service logic for SCF FE

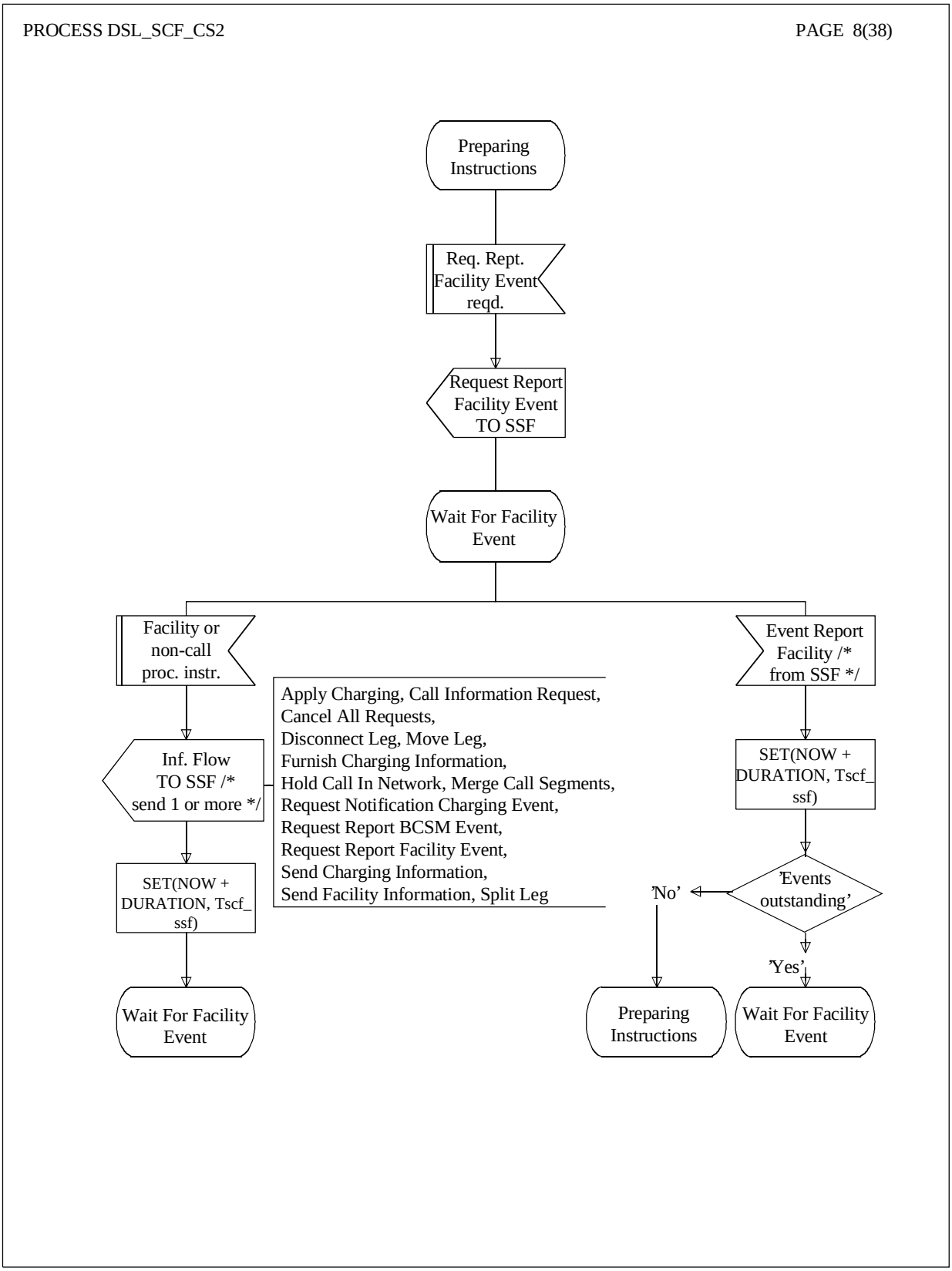

Figure 11-112/Q.1224 (sheet 8 of 38) – Distributed service logic for SCF FE

PROCESS DSL_SCF_CS2 PAGE 9(38)

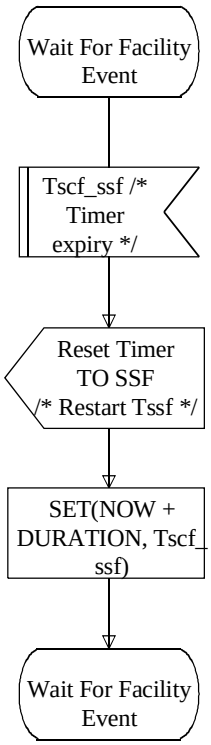

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Figure 11-112/Q.1224 (sheet 9 of 38) – Distributed service logic for SCF FE

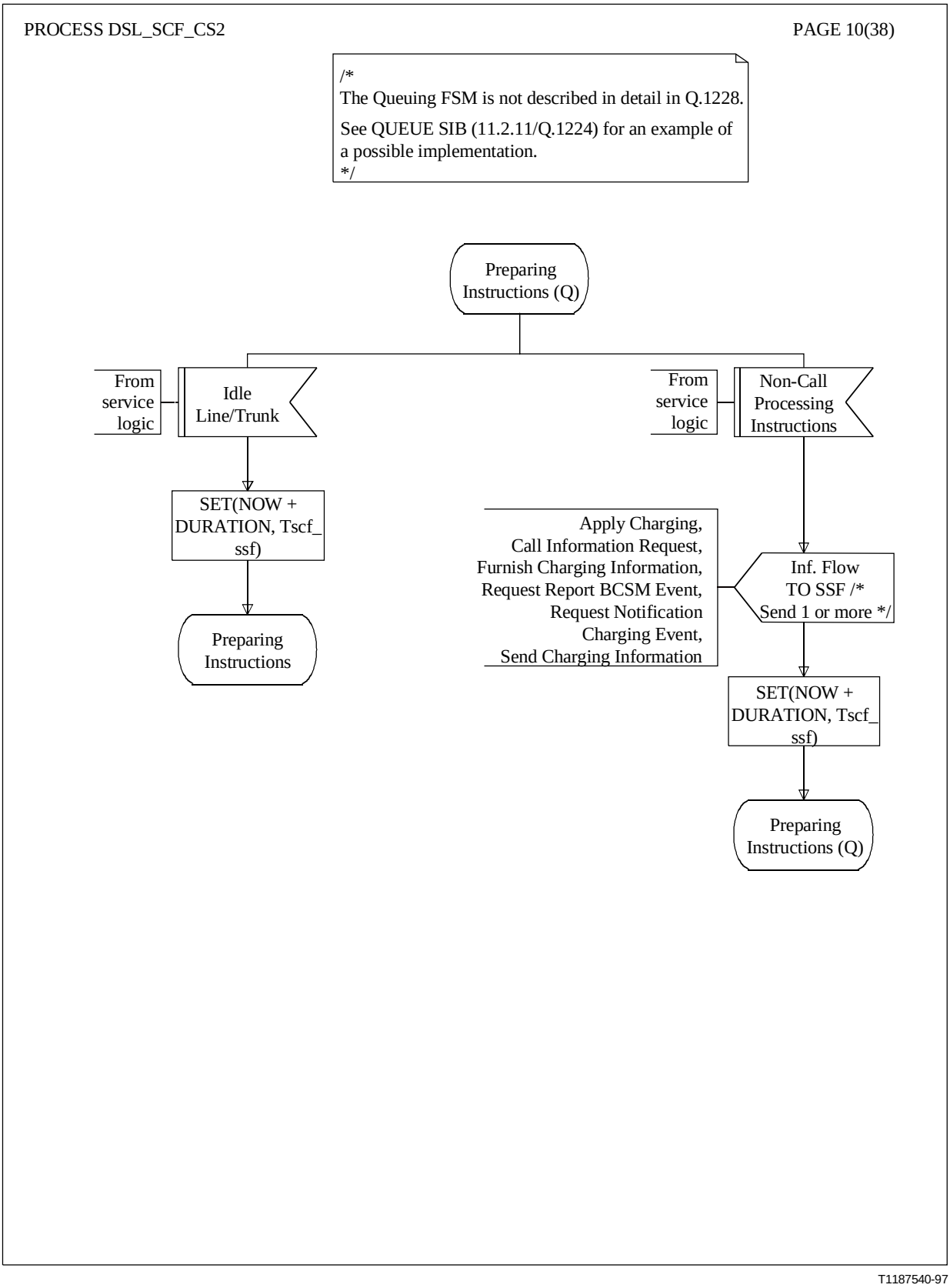

Figure 11-112/Q.1224 (sheet 10 of 38) – Distributed service logic for SCF FE

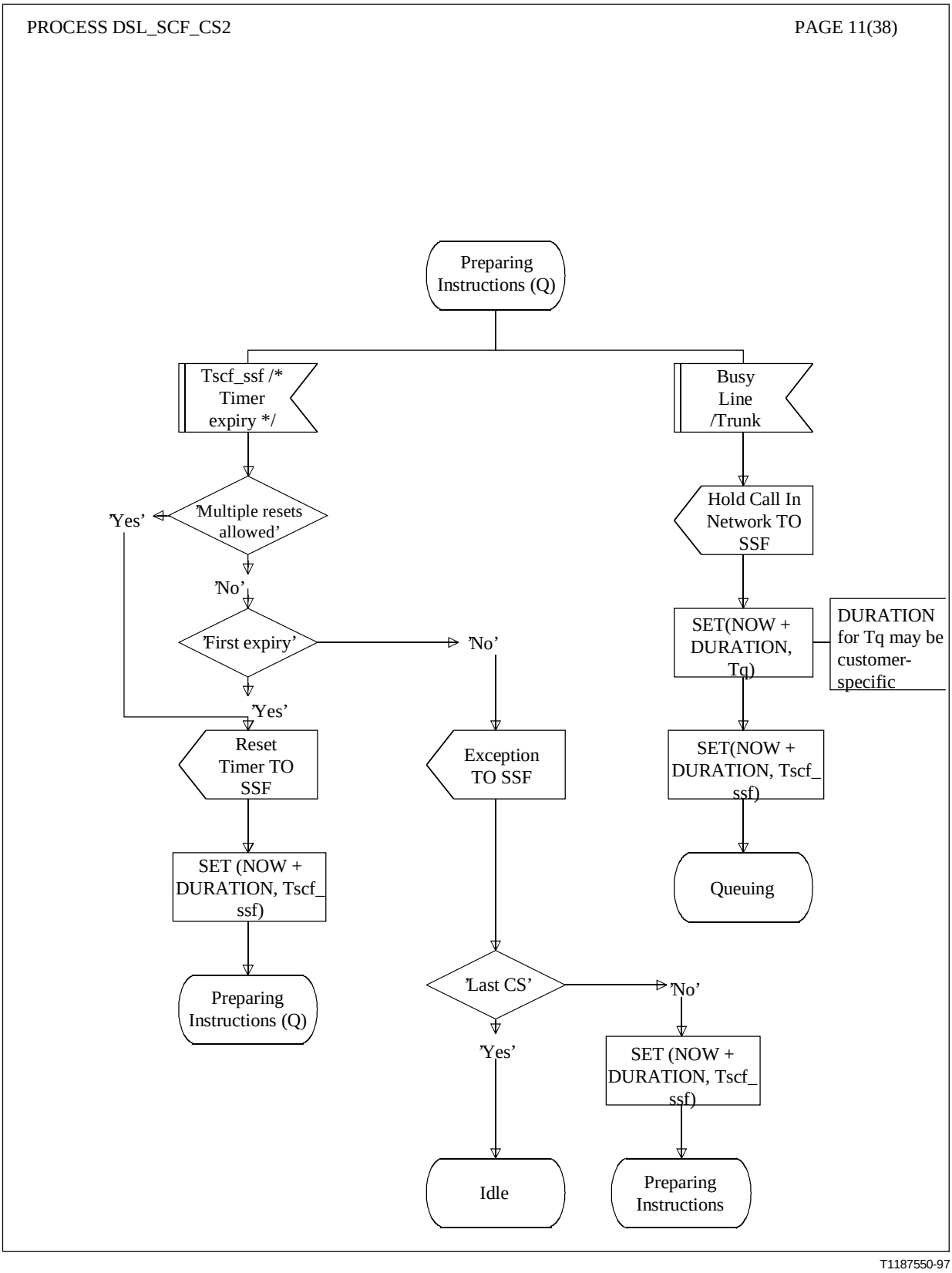

Figure 11-112/Q.1224 (sheet 11 of 38) – Distributed service logic for SCF FE

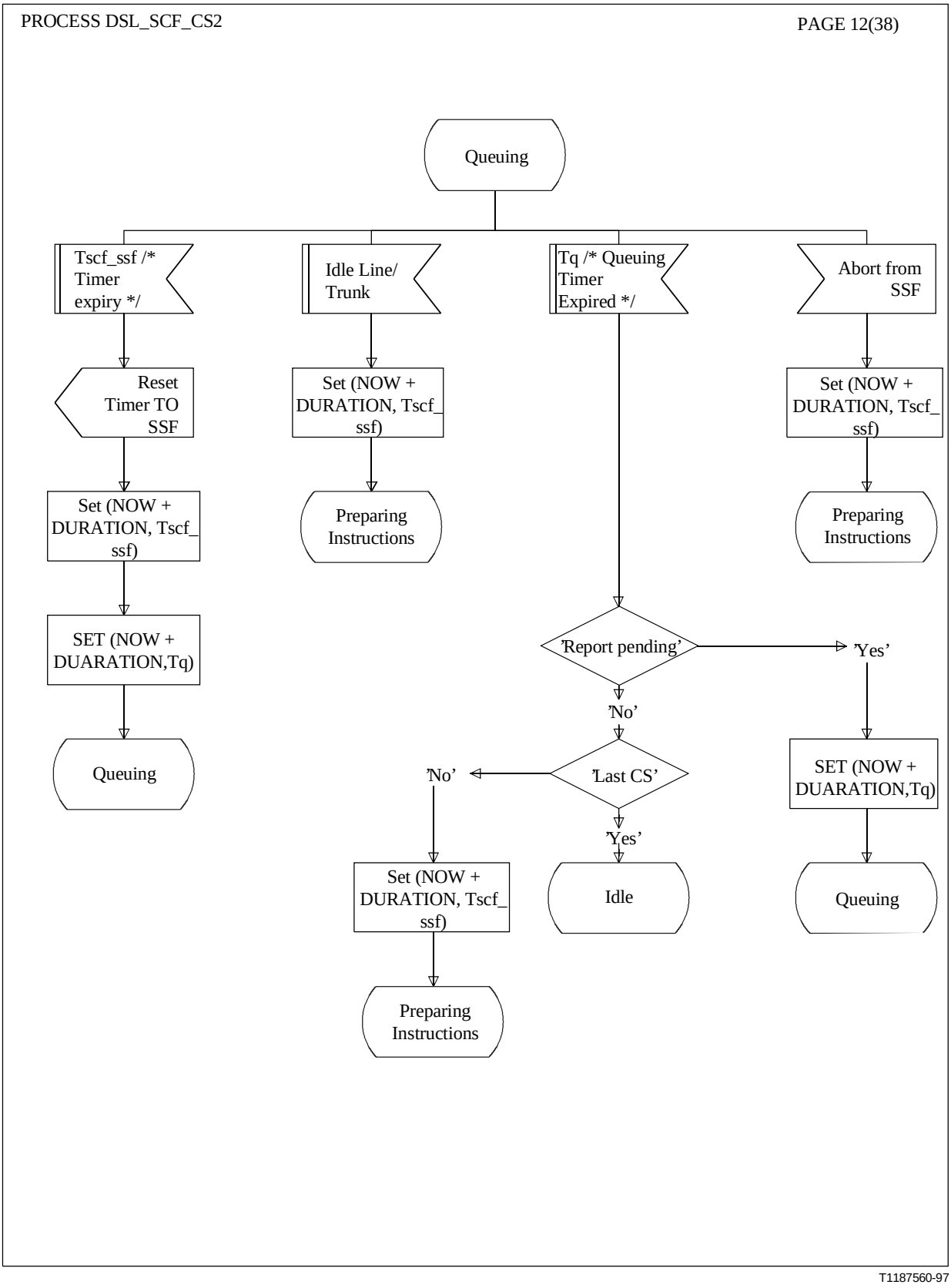

Figure 11-112/Q.1224 (sheet 12 of 38) – Distributed service logic for SCF FE

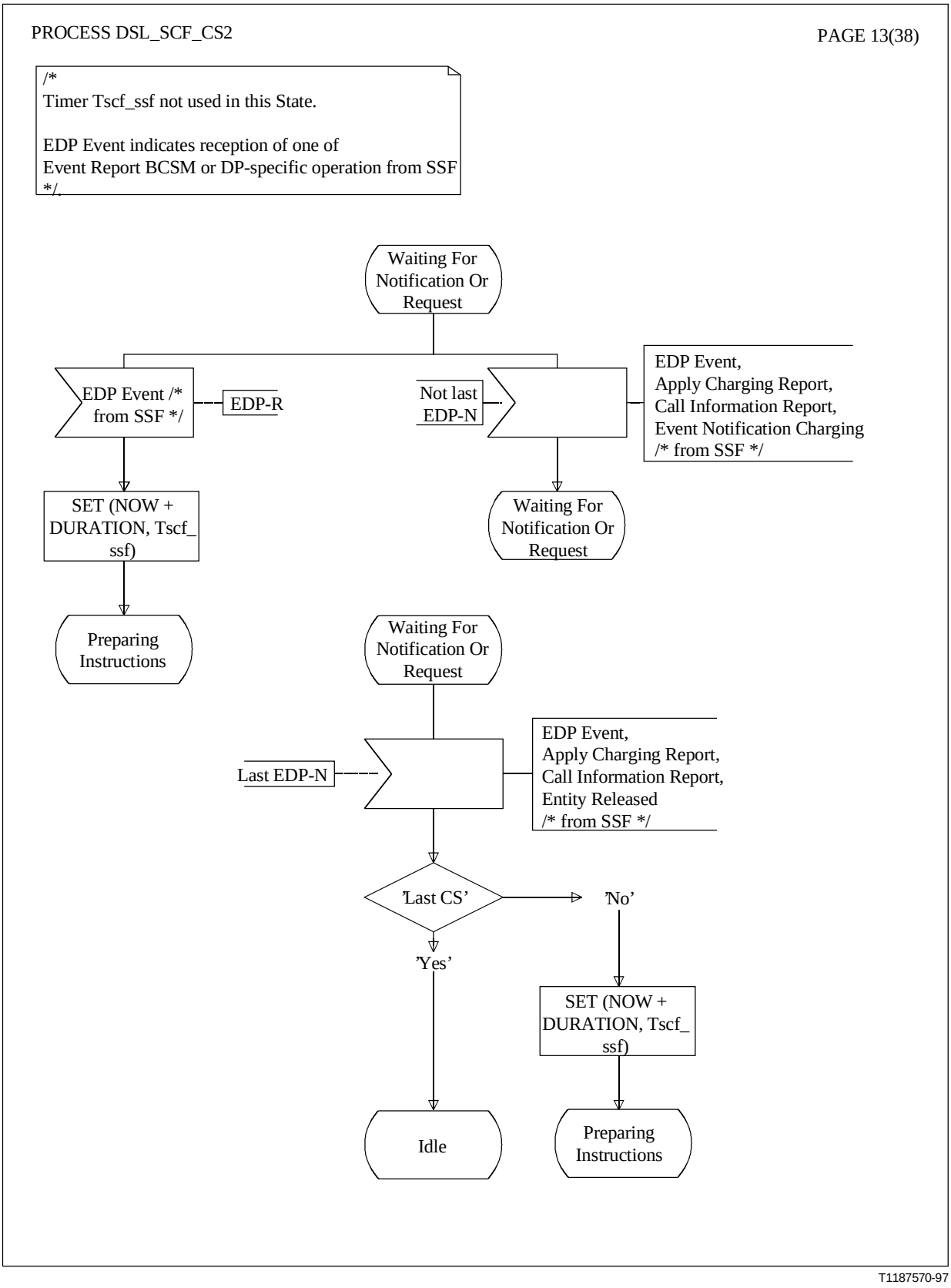

Figure 11-112/Q.1224 (sheet 13 of 38) – Distributed service logic for SCF FE

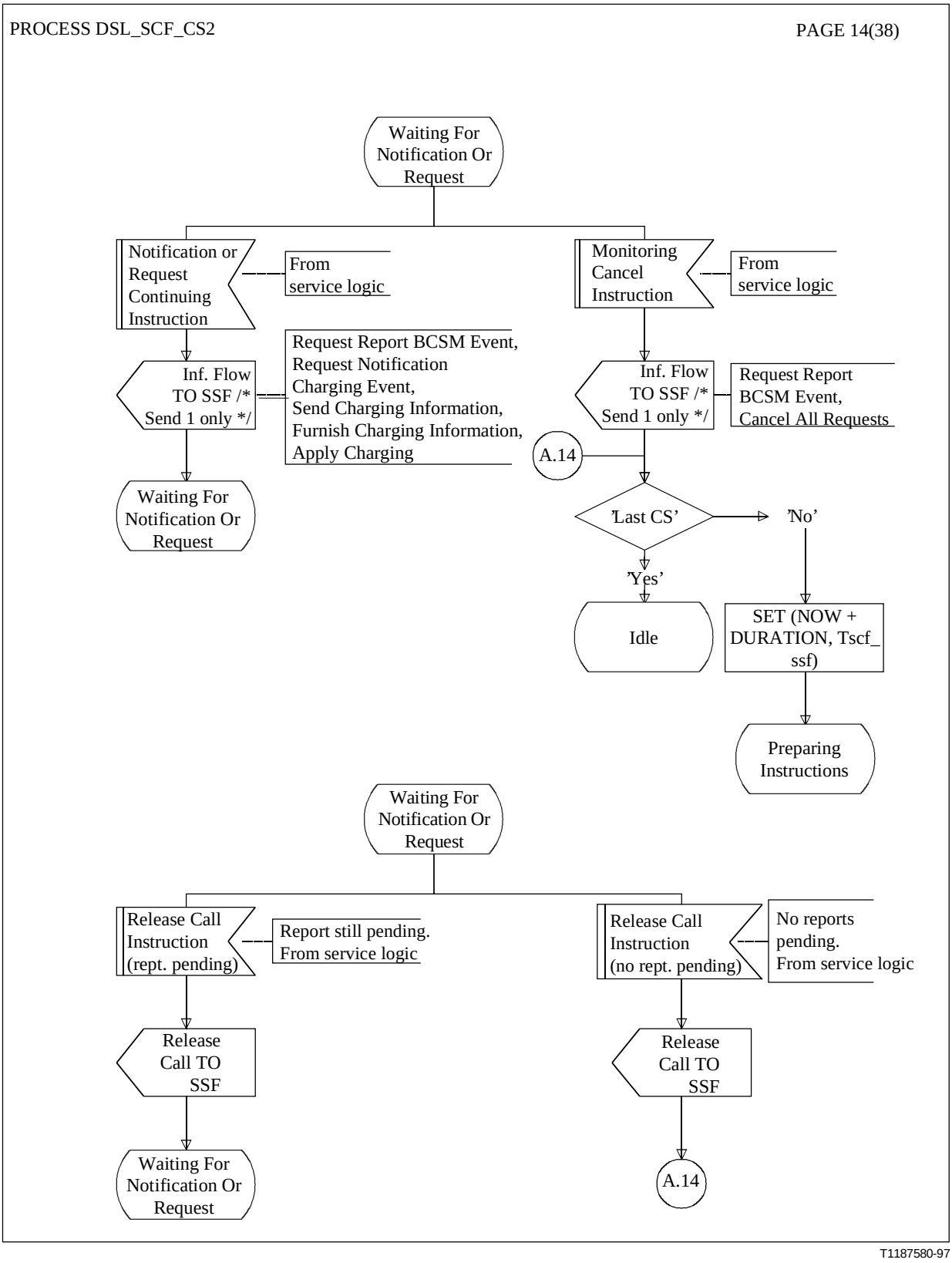

Figure 11-112/Q.1224 (sheet 14 of 38) – Distributed service logic for SCF FE

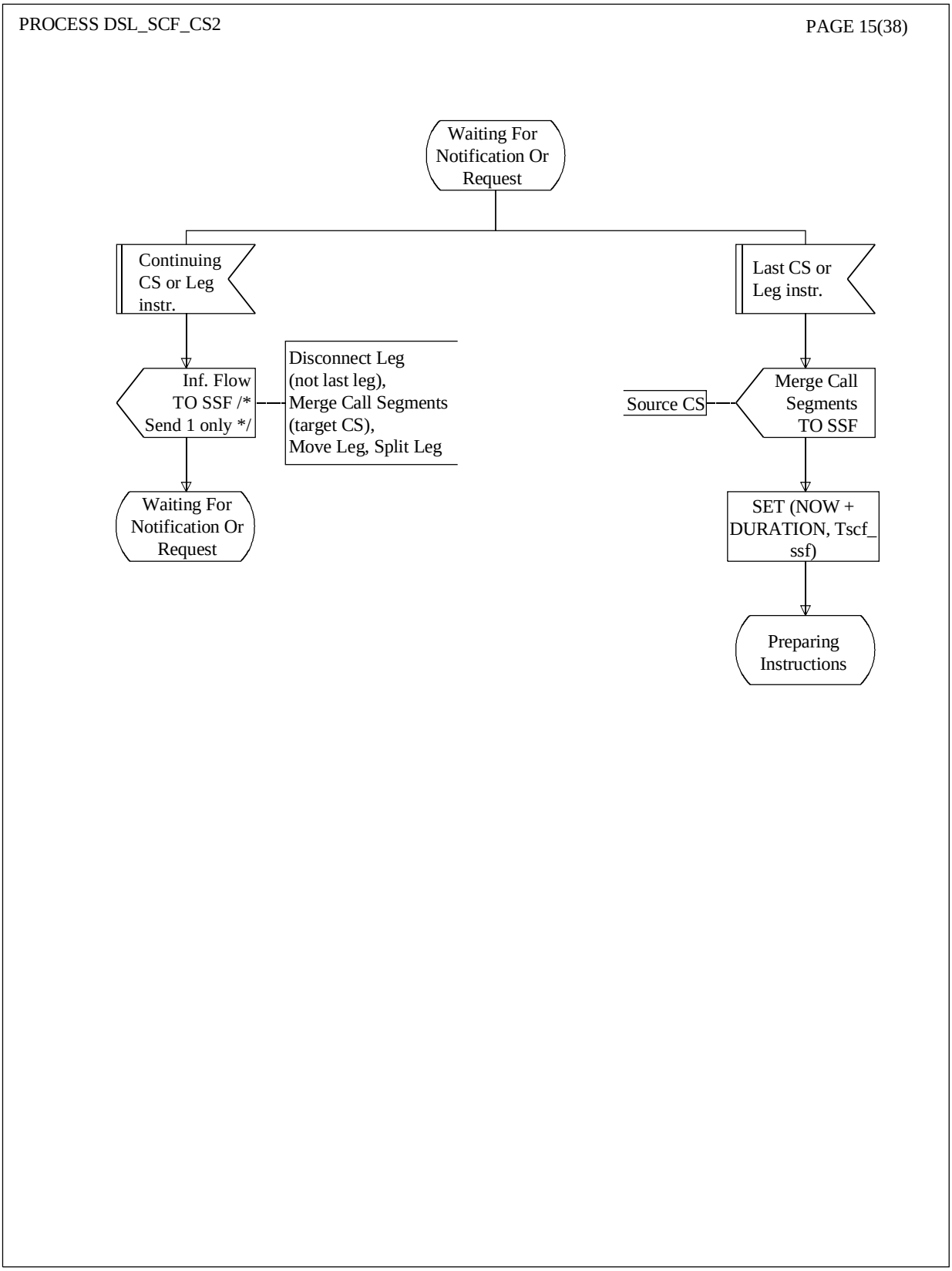

Figure 11-112/Q.1224 (sheet 15 of 38) – Distributed service logic for SCF FE

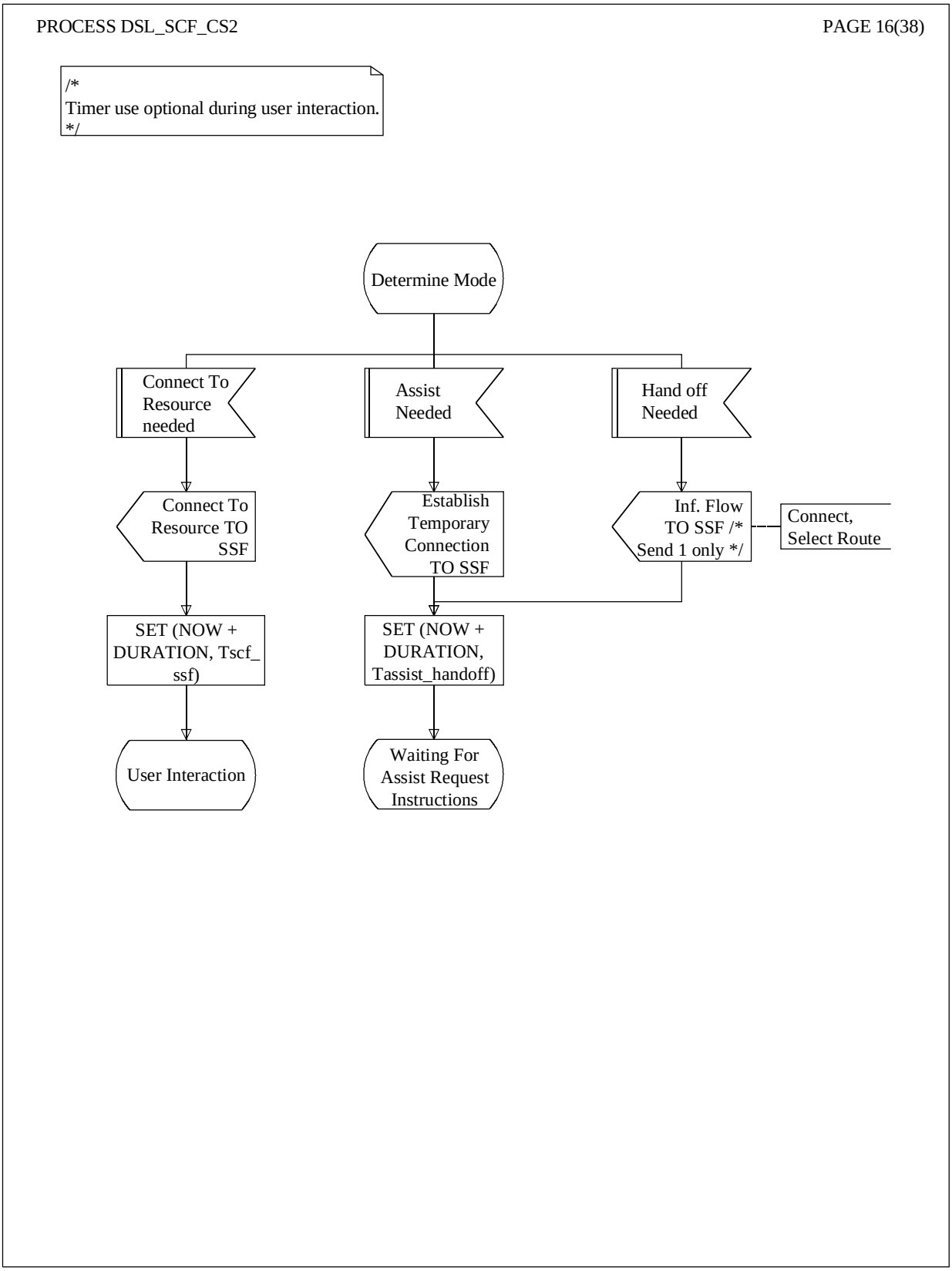

Figure 11-112/Q.1224 (sheet 16 of 38) – Distributed service logic for SCF FE

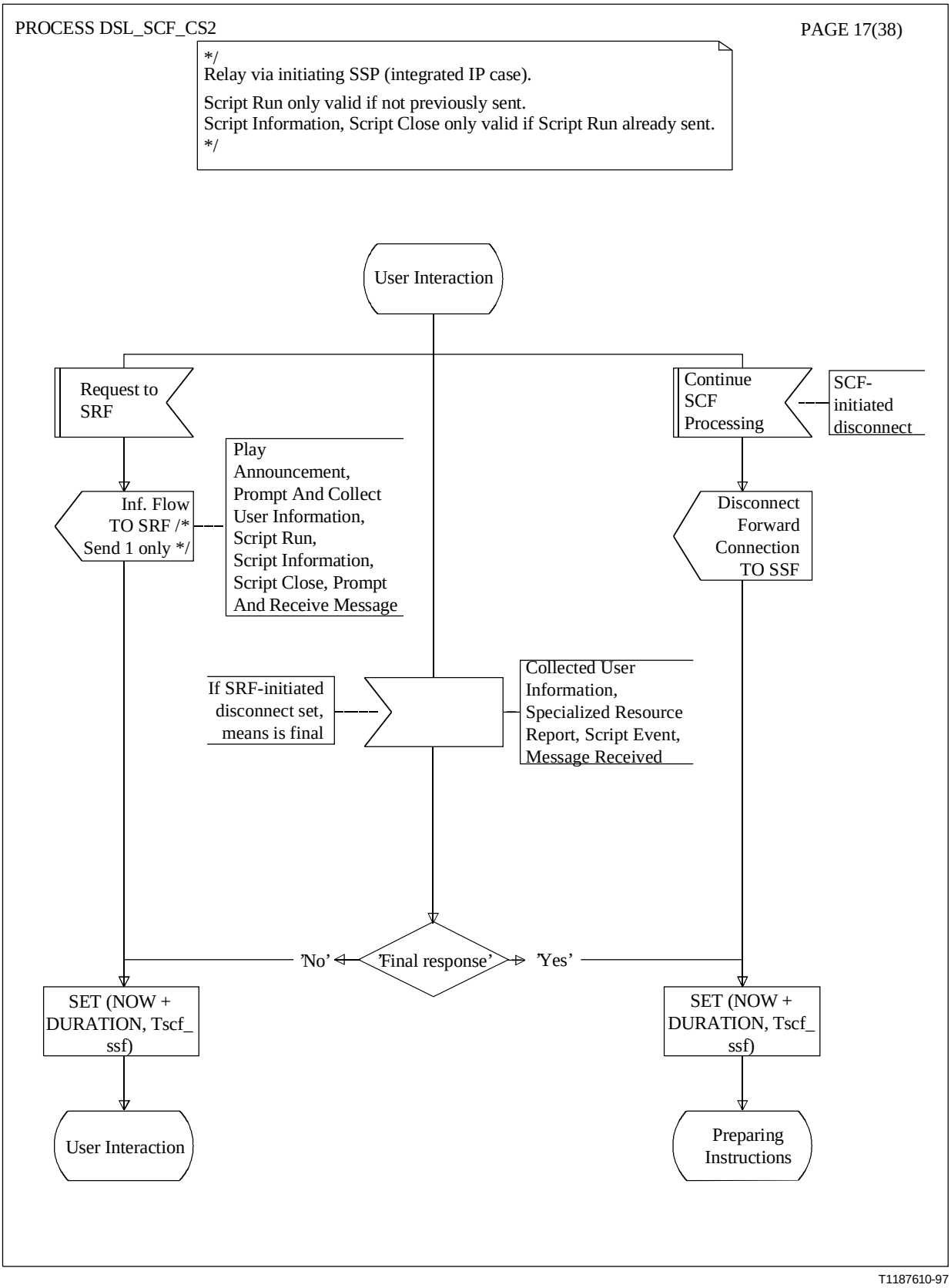

Figure 11-112/Q.1224 (sheet 17 of 38) – Distributed service logic for SCF FE

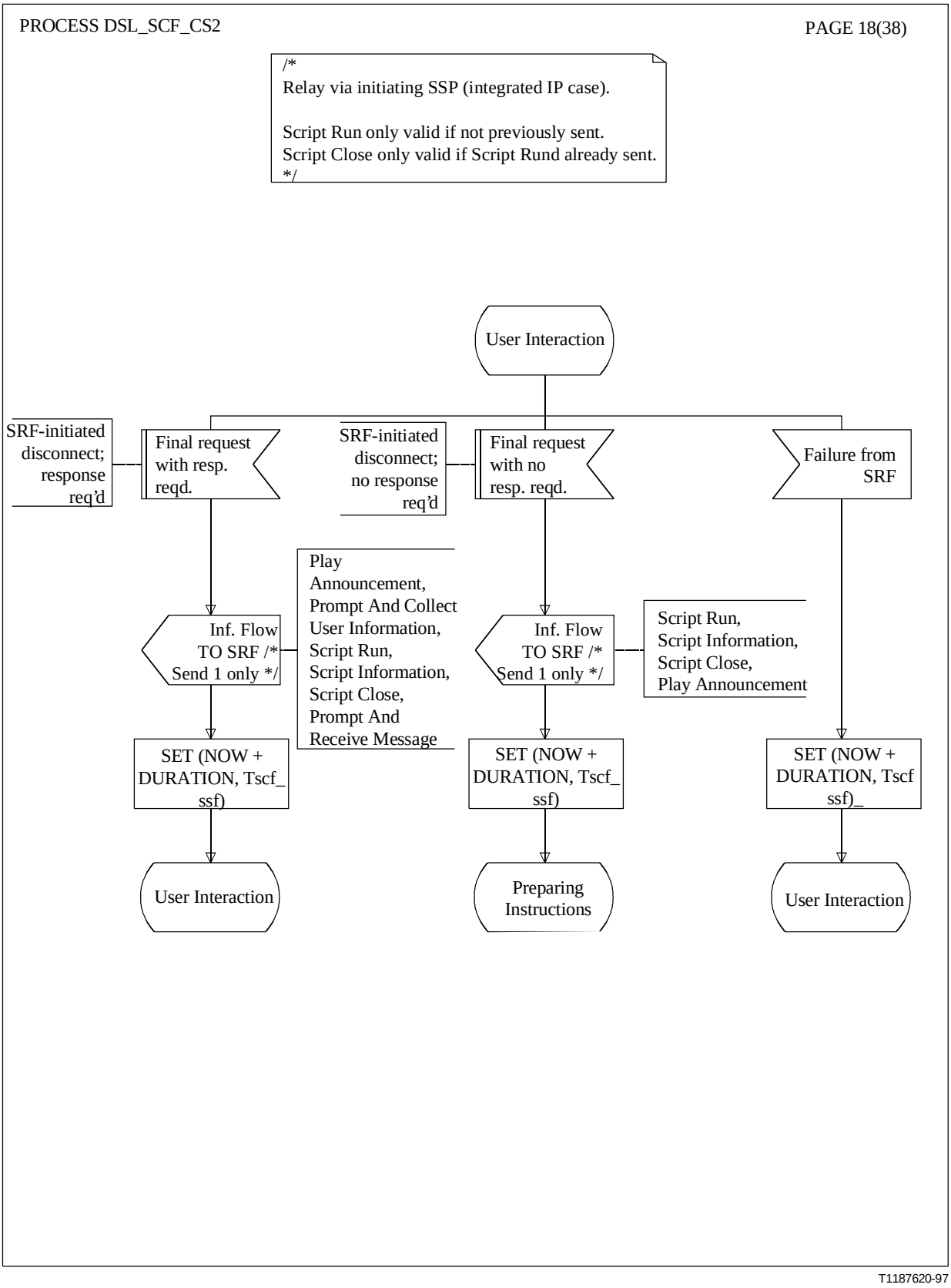

Figure 11-112/Q.1224 (sheet 18 of 38) – Distributed service logic for SCF FE

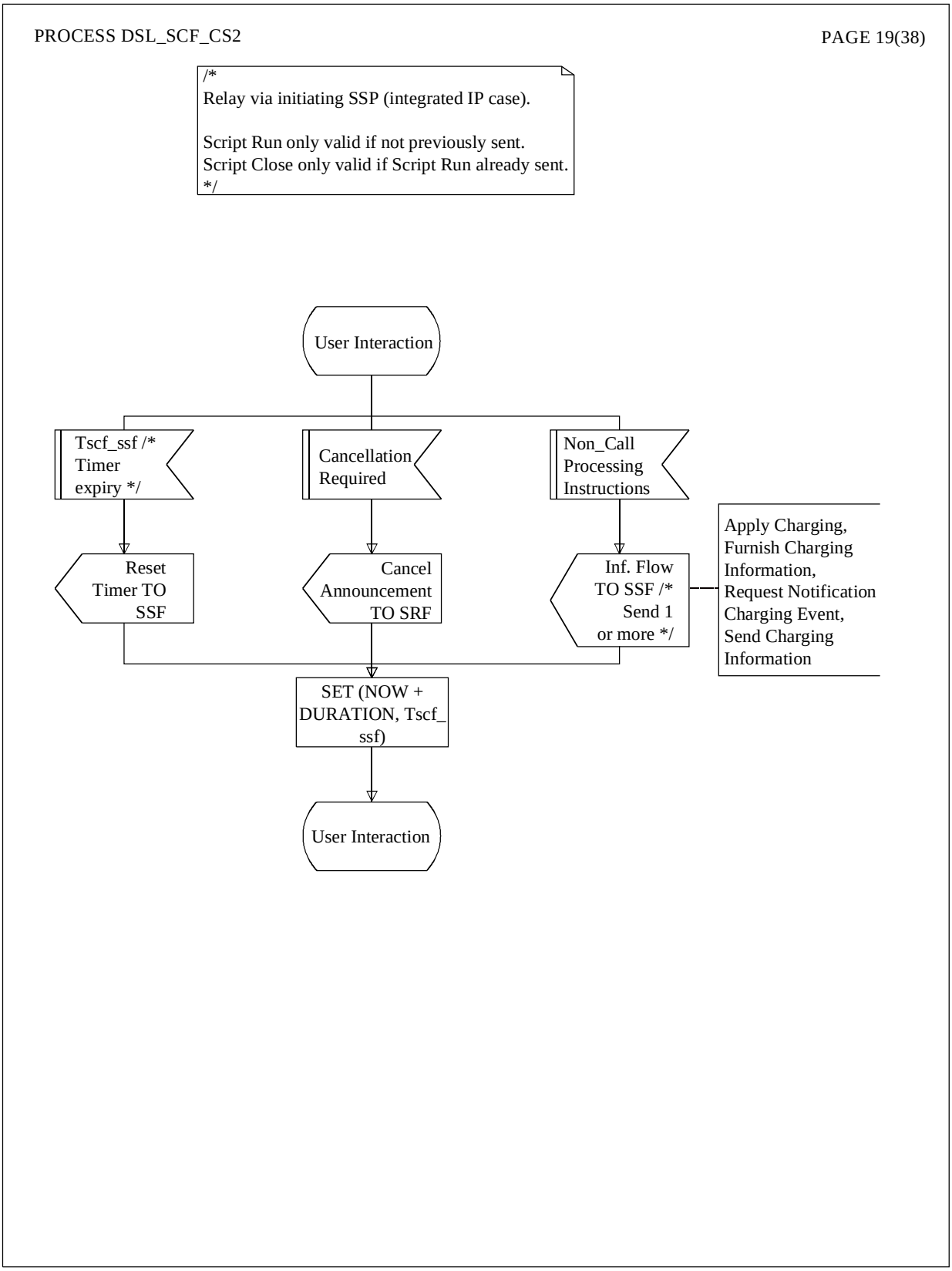

Figure 11-112/Q.1224 (sheet 19 of 38) – Distributed service logic for SCF FE

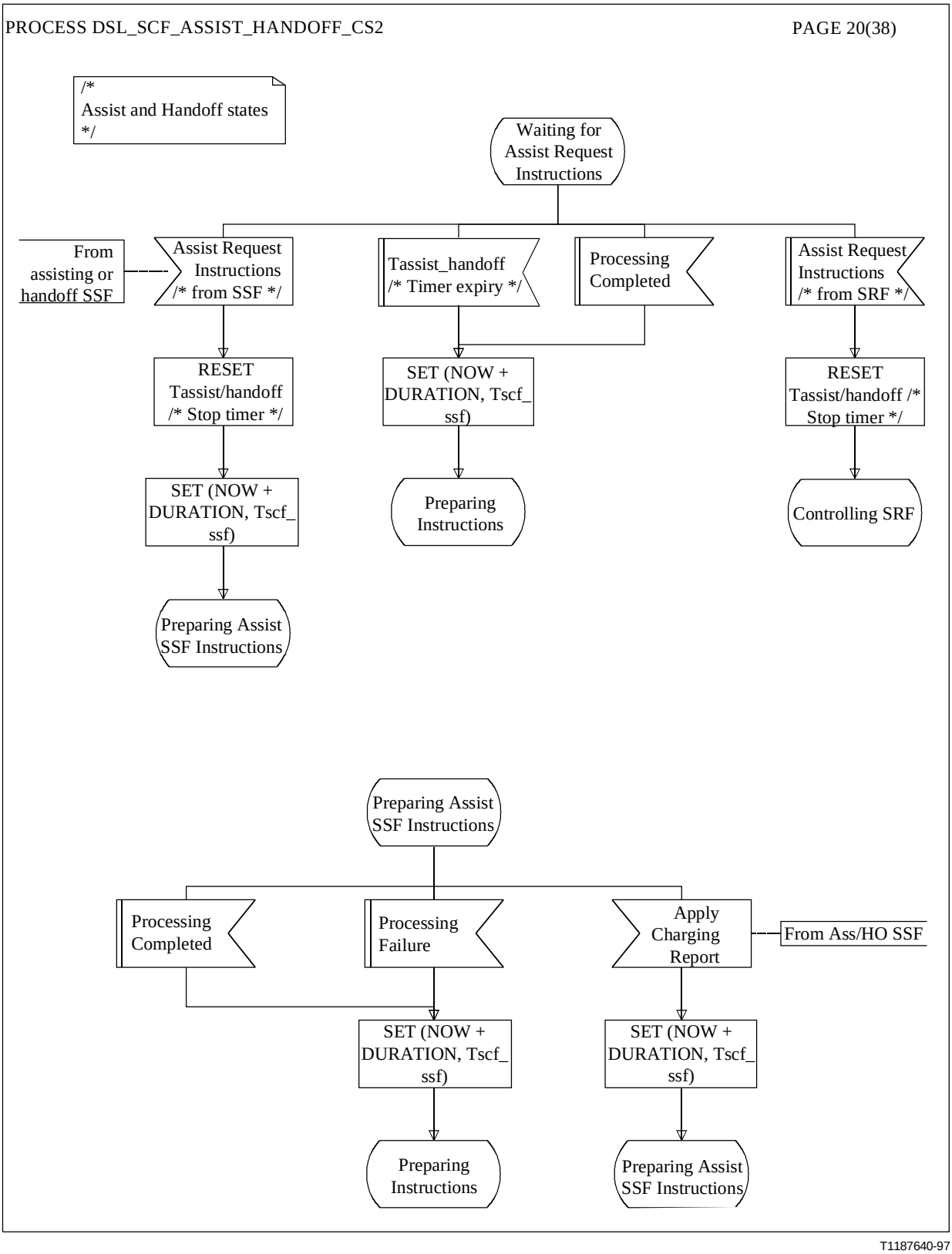

Figure 11-112/Q.1224 (sheet 20 of 38) – Distributed service logic for SCF FE

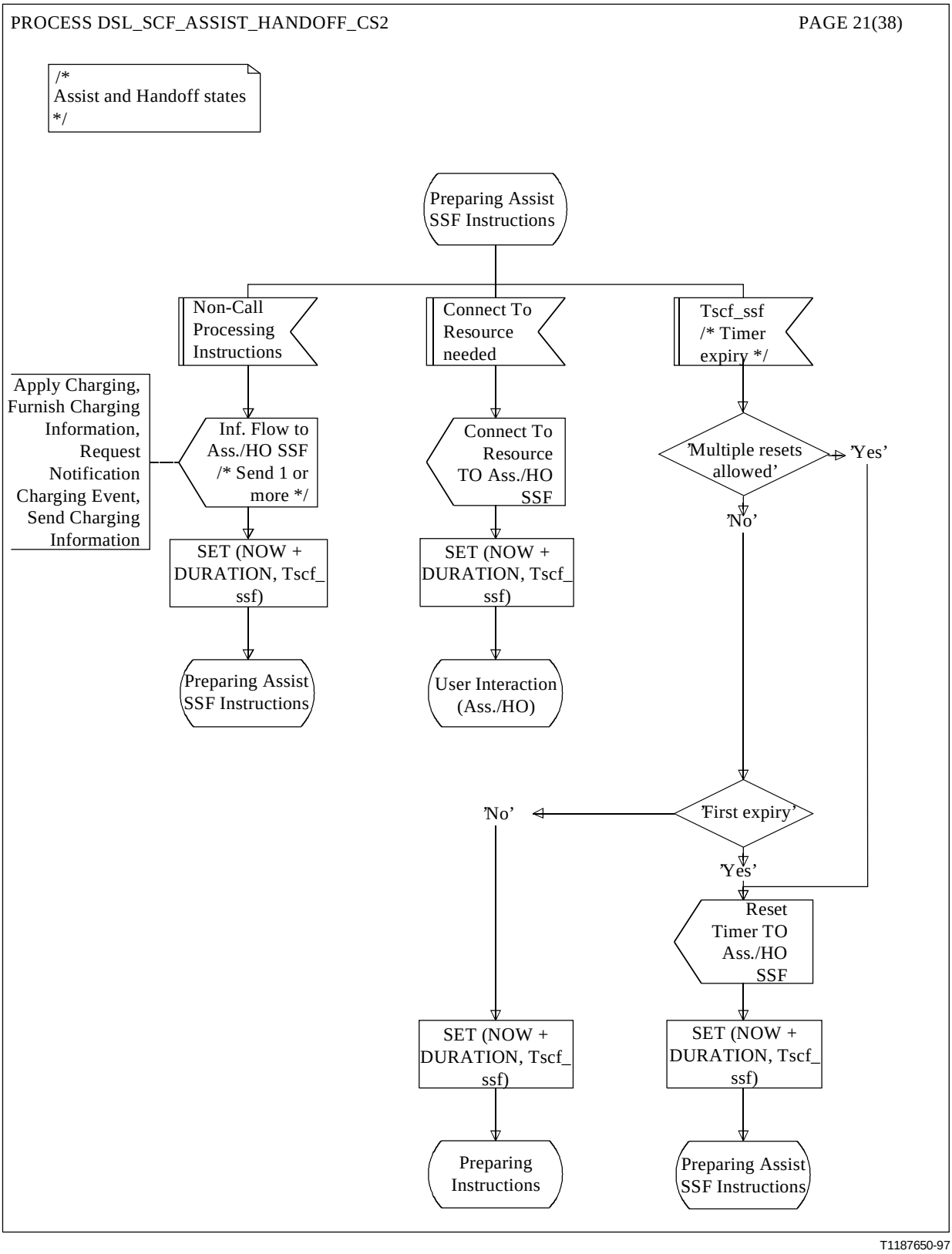

Figure 11-112/Q.1224 (sheet 21 of 38) – Distributed service logic for SCF FE

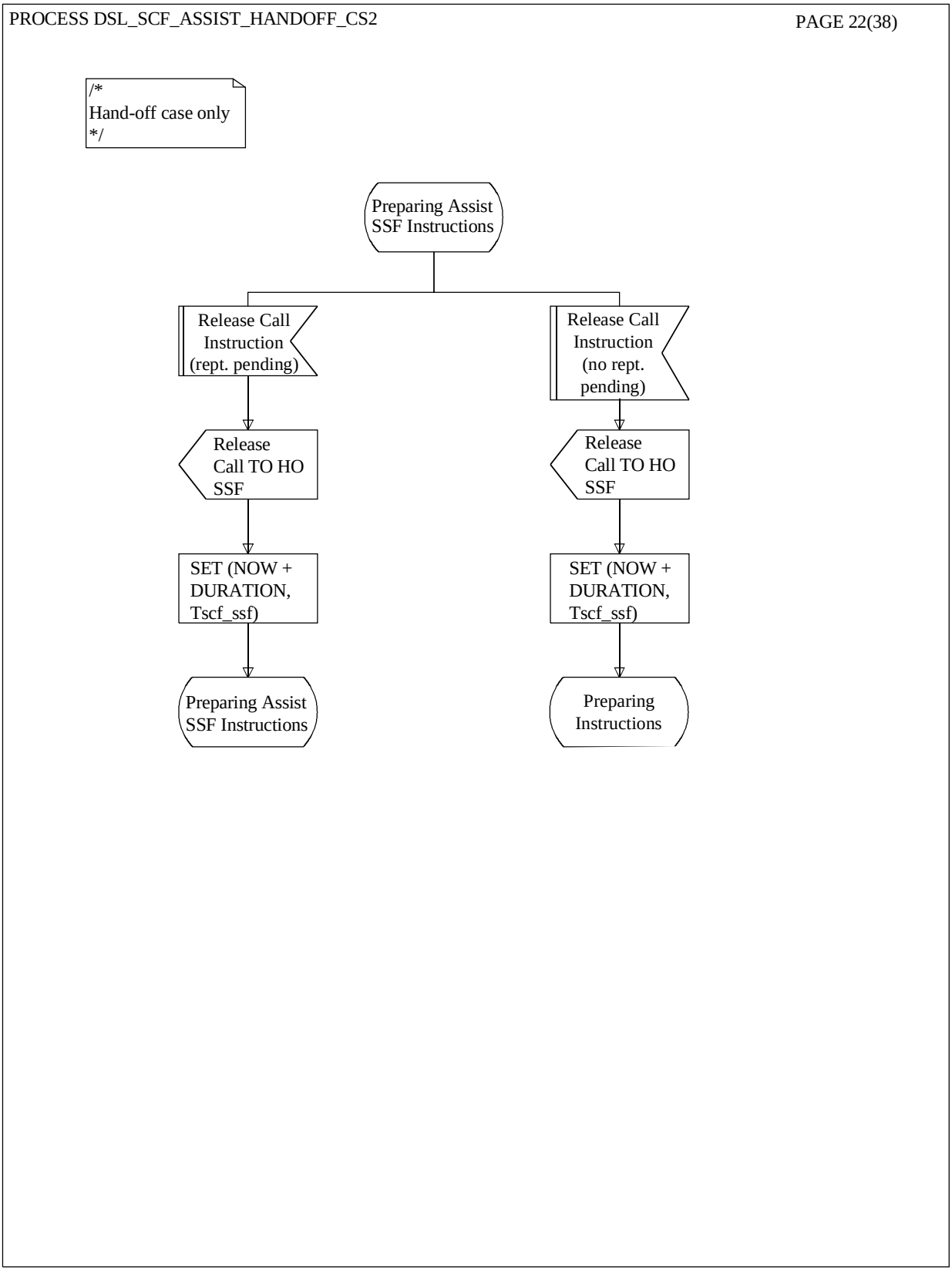

Figure 11-112/Q.1224 (sheet 22 of 38) – Distributed service logic for SCF FE

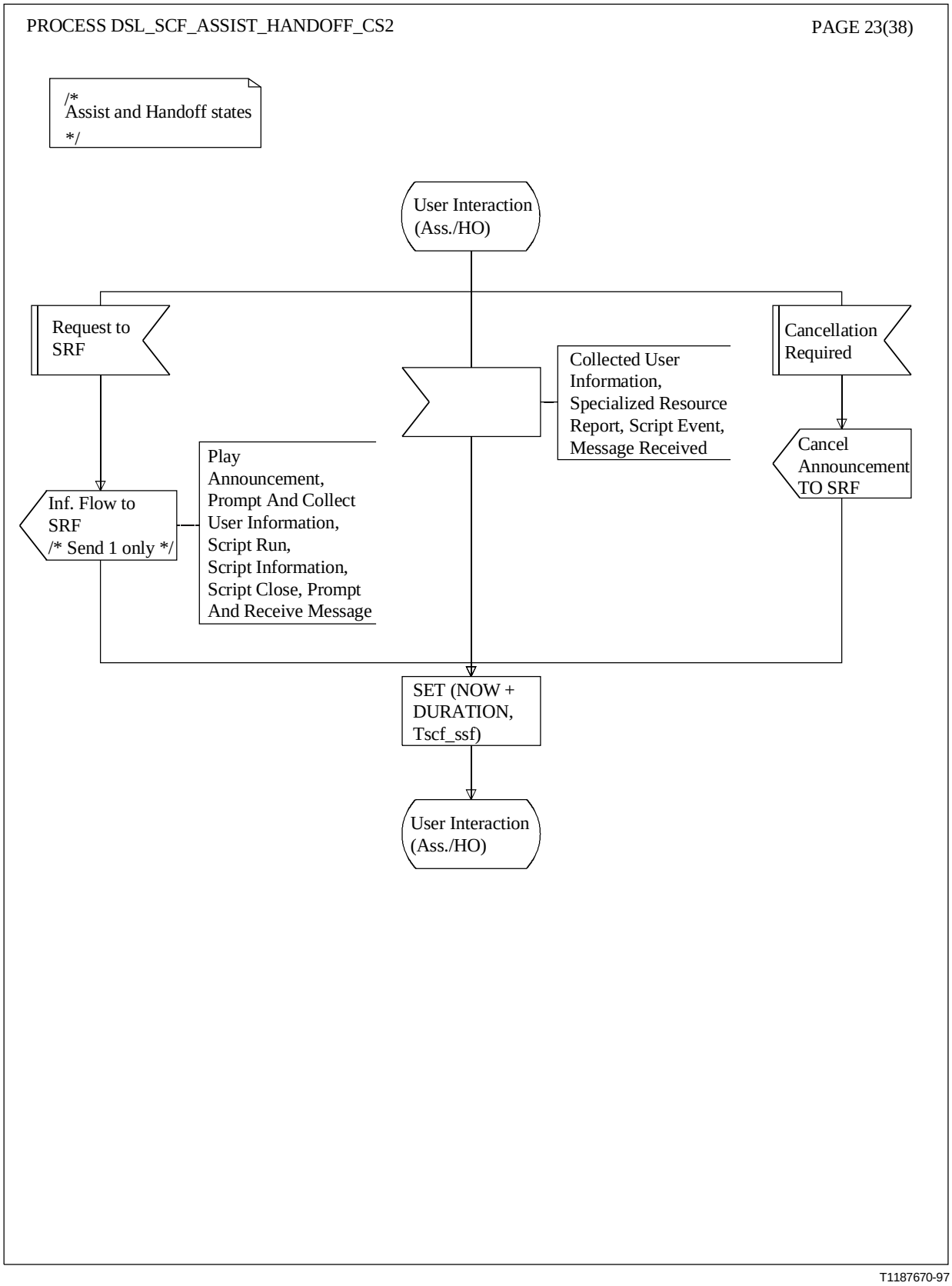

Figure 11-112/Q.1224 (sheet 23 of 38) – Distributed service logic for SCF FE

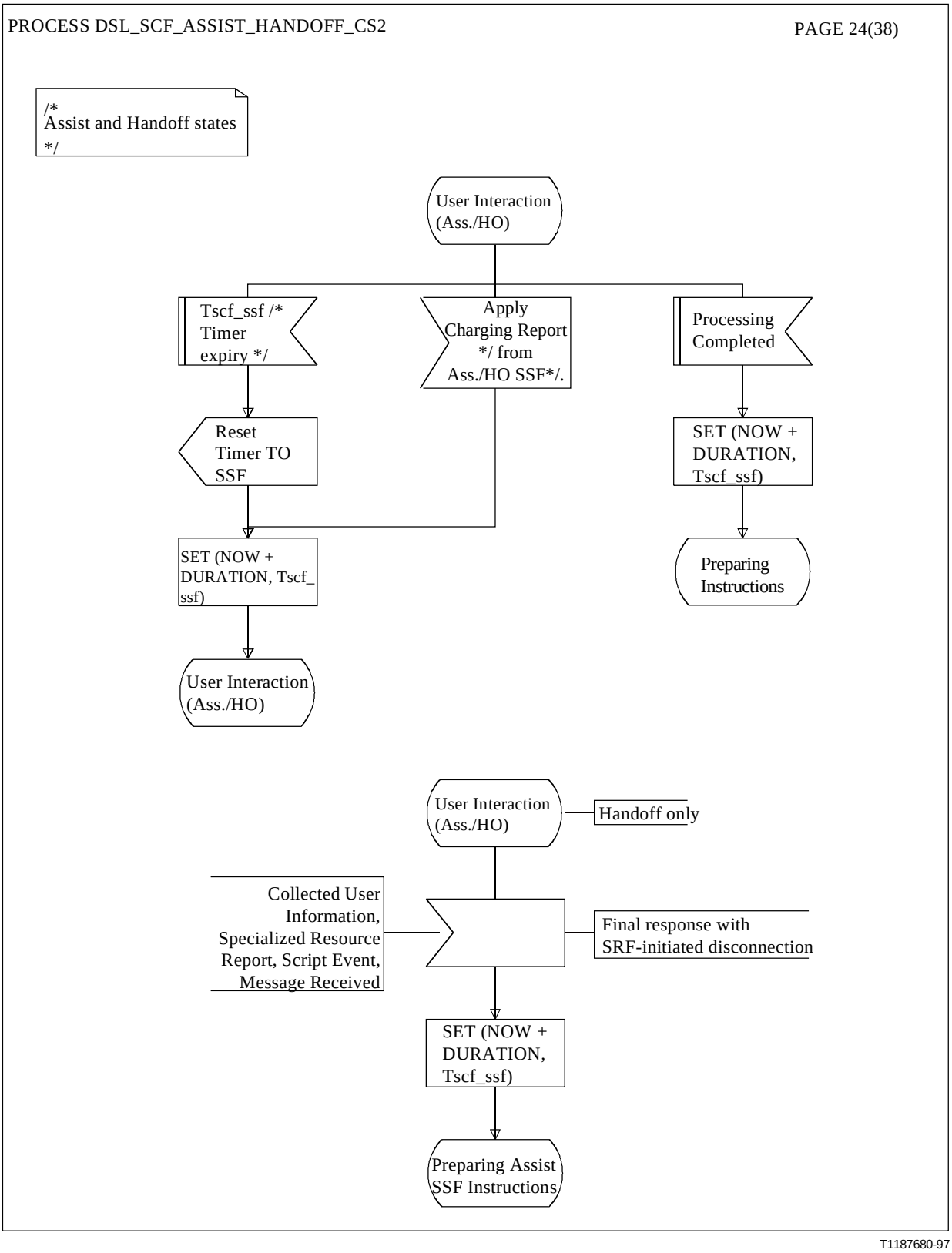

Figure 11-112/Q.1224 (sheet 24 of 38) – Distributed service logic for SCF FE

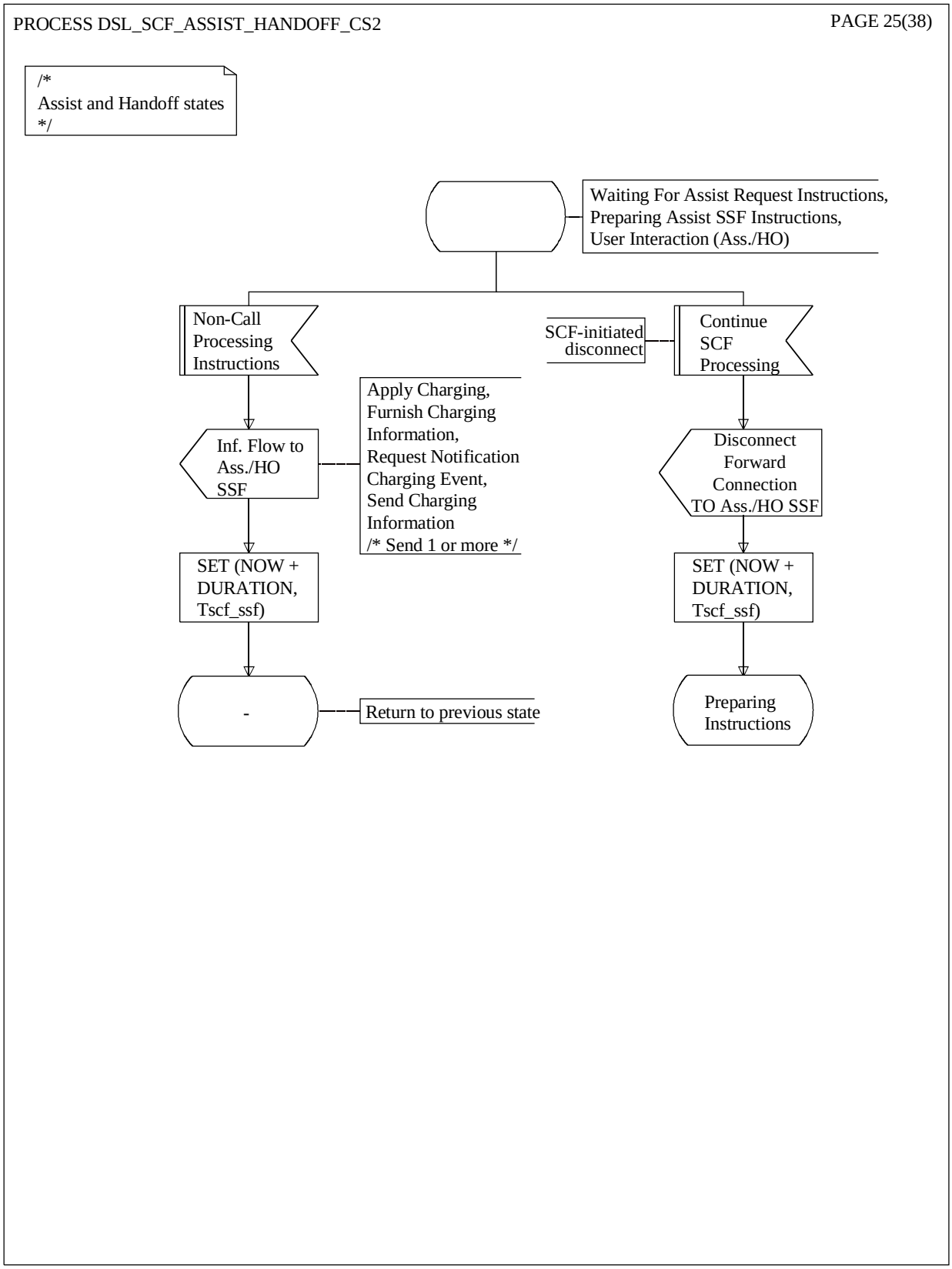

Figure 11-112/Q.1224 (sheet 25 of 38) – Distributed service logic for SCF FE

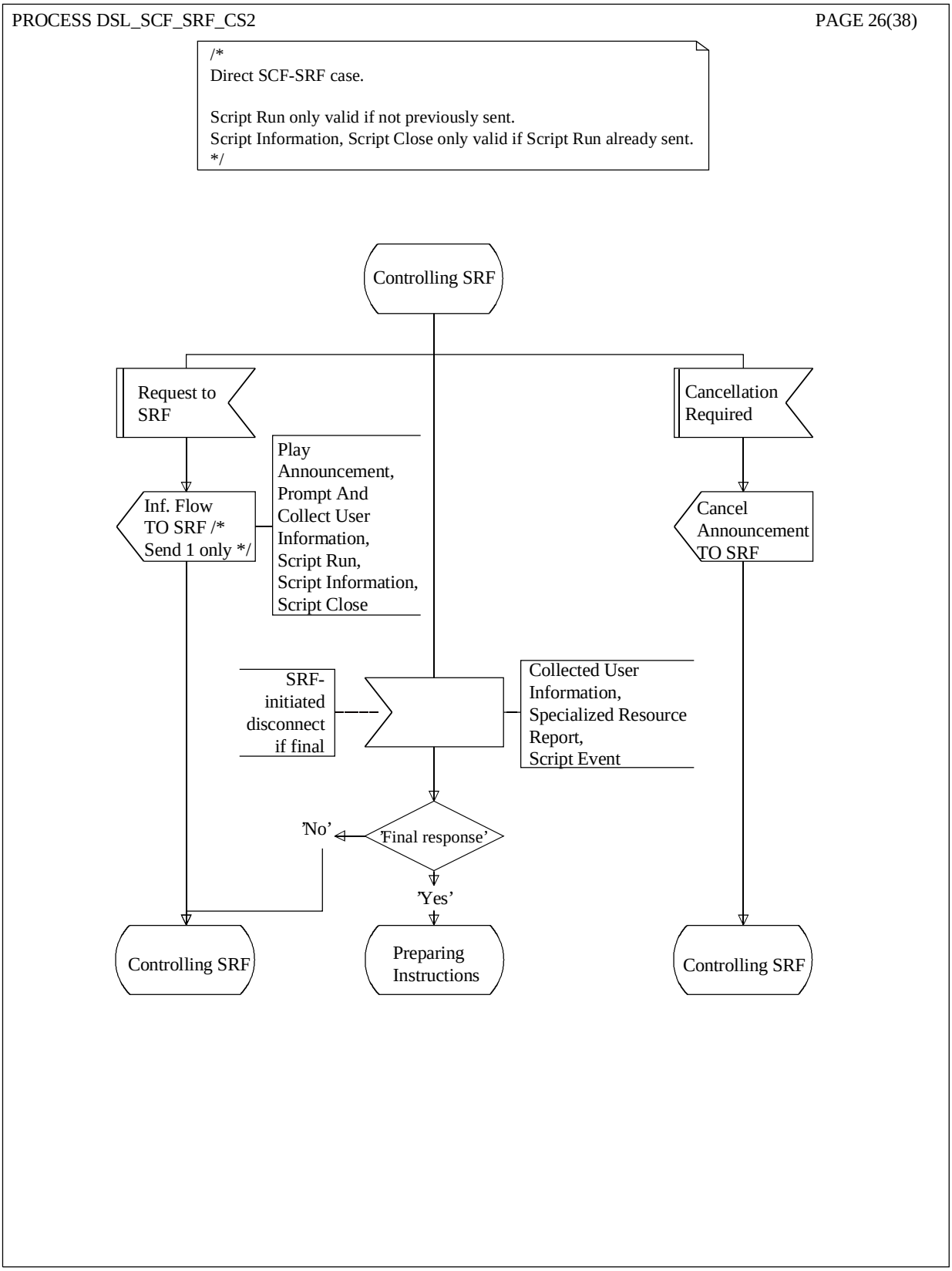

Figure 11-112/Q.1224 (sheet 26 of 38) – Distributed service logic for SCF FE

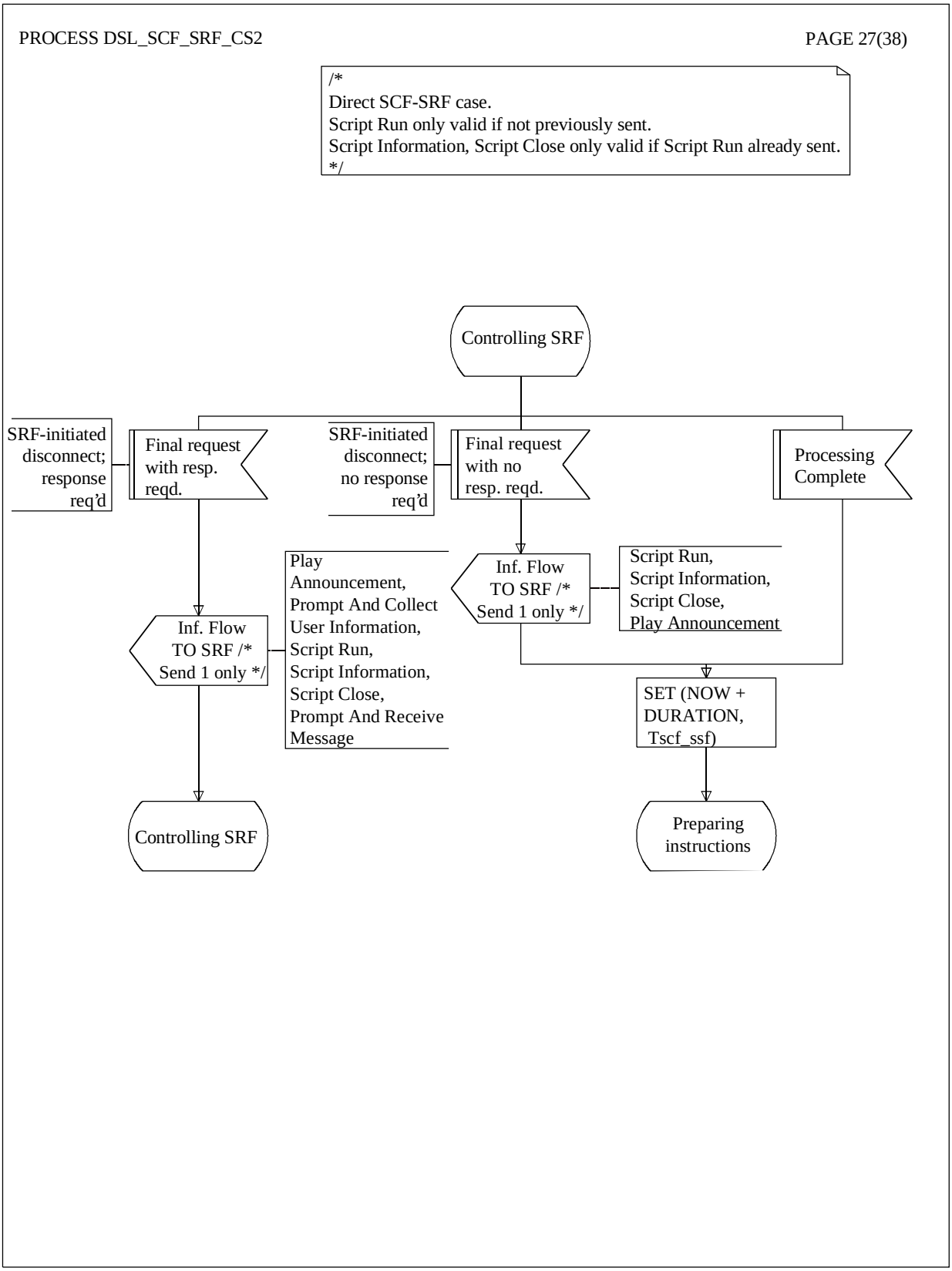

Figure 11-112/Q.1224 (sheet 27 of 38) – Distributed service logic for SCF FE

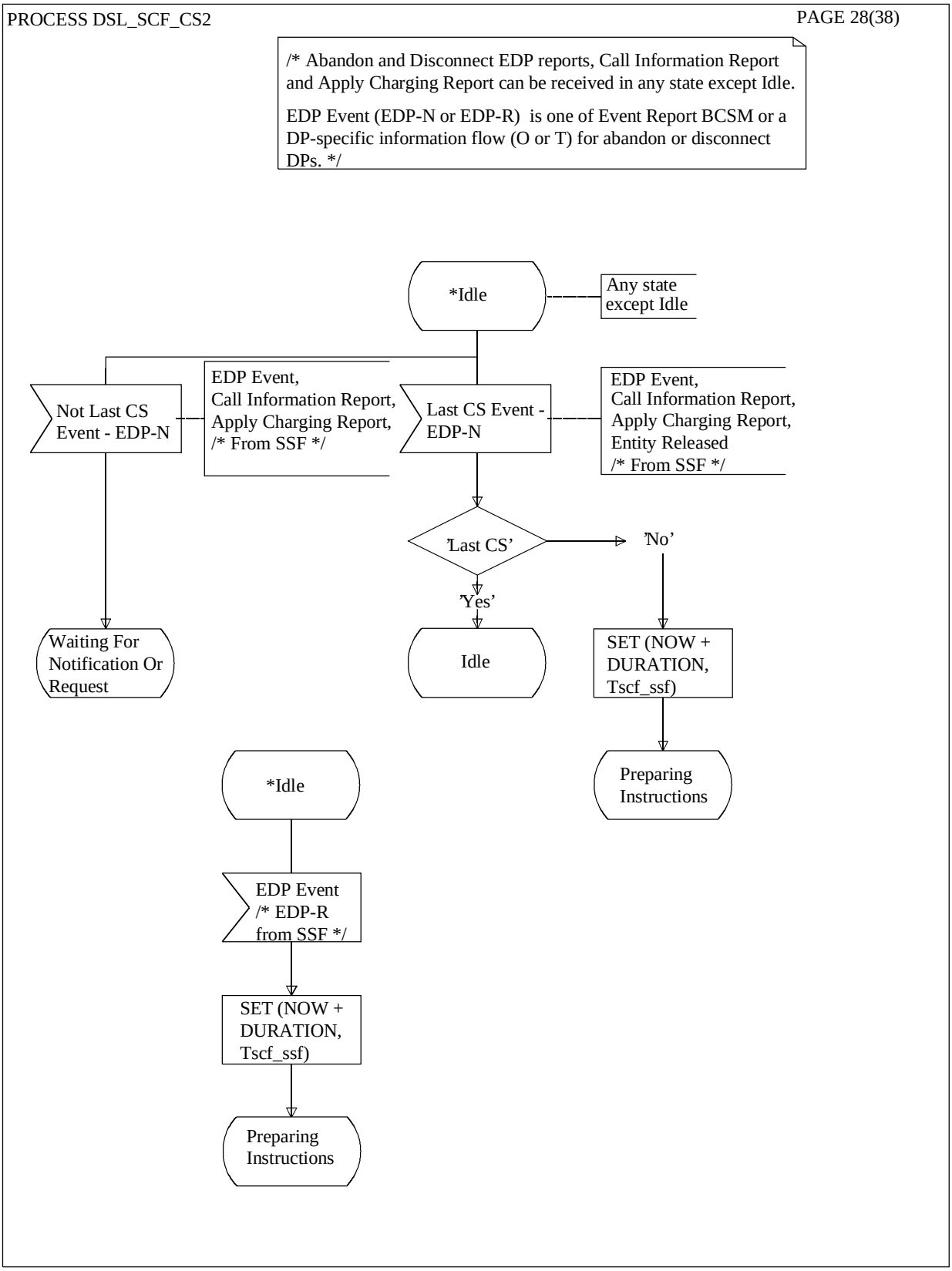

Figure 11-112/Q.1224 (sheet 28 of 38) – Distributed service logic for SCF FE

PROCESS DSL_SCF_SDF_CS2 PAGE 29(38)

```
/* Distributed service logic for SDF-related states of SCF.
Based on subclause 12.5.2, Recommendation Q.1288 .

For the distributed service logic, the term "Bind" in INAP on the SCF-SDF interface
is replaced with ”Authenticate" and the Authenticate Result must be received before the
first data access request is sent to the SDF.

The names of the internal events and SDL states have been changed to reflect this difference.
*/
```

```
/* Local names for internal signals.
Signals from internal SCF logic.
*/
/* From SCF service logic */
SIGNAL Authenticate Required, Request to SDF, End
Authenticate;
```

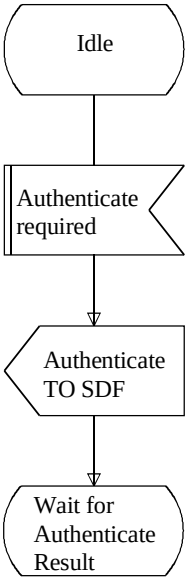

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Figure 11-112/Q.1224 (sheet 29 of 38) – Distributed service logic for SCF FE

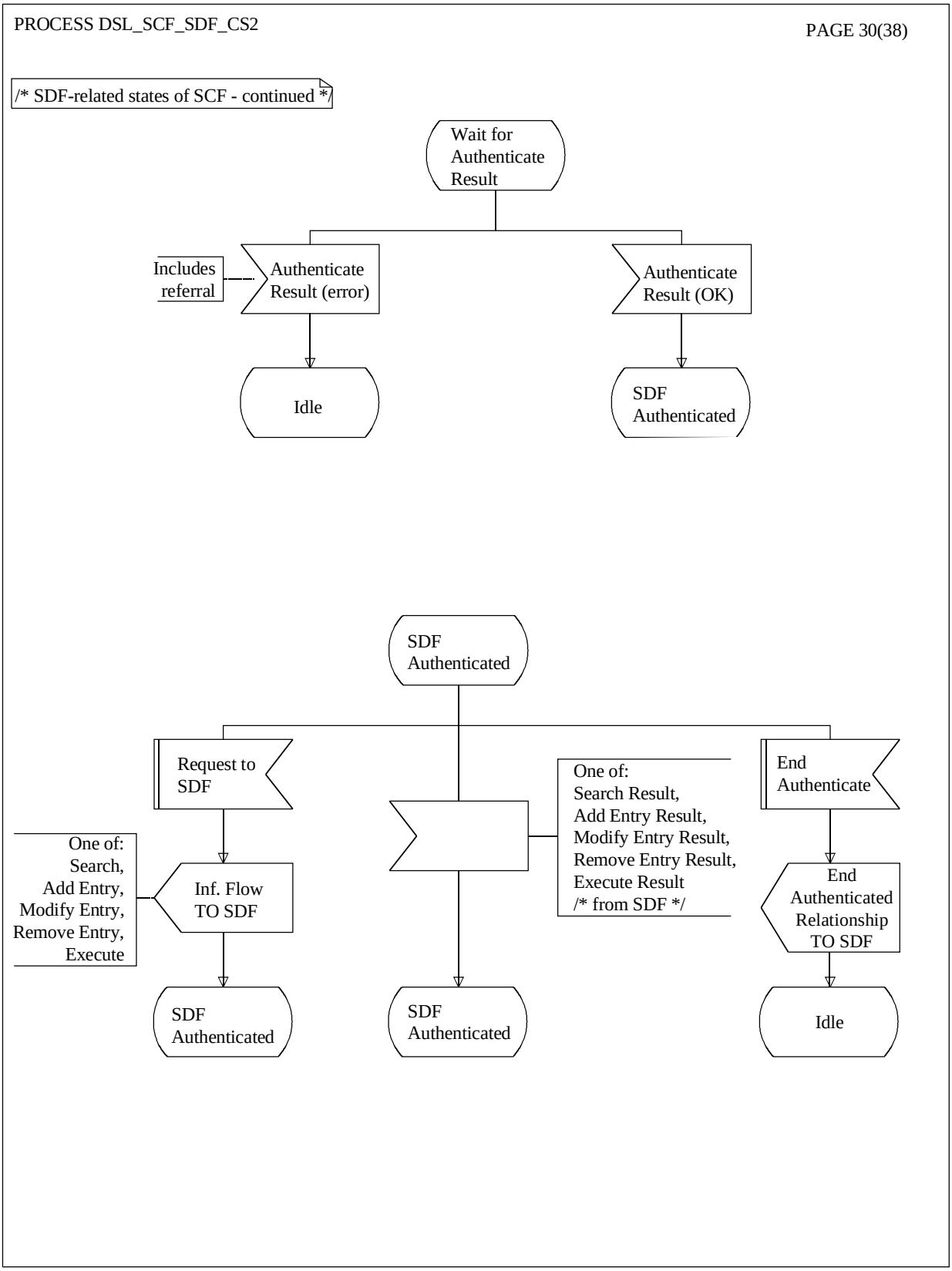

Figure 11-112/Q.1224 (sheet 30 of 38) – Distributed service logic for SCF FE

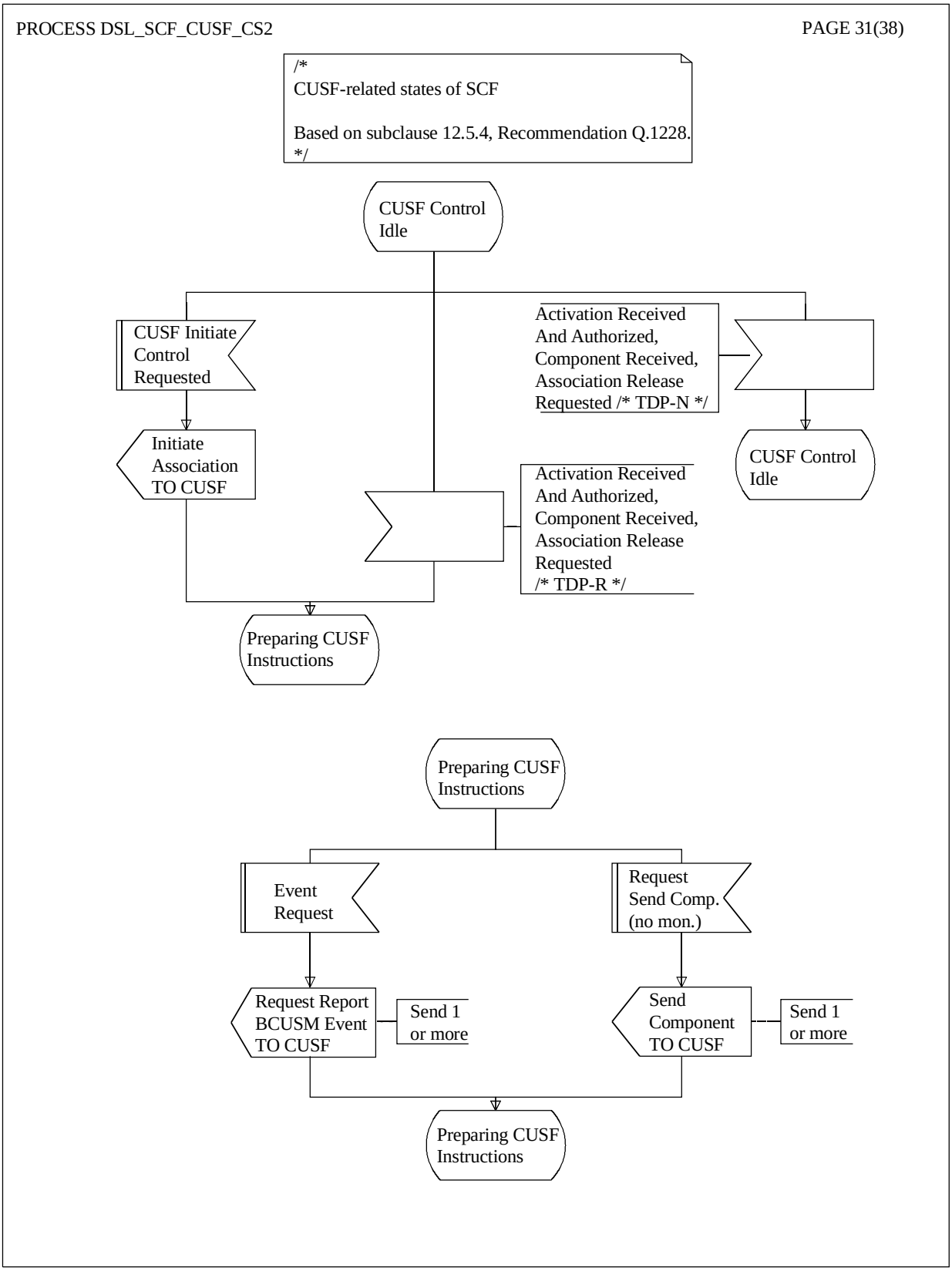

Figure 11-112/Q.1224 (sheet 31 of 38) – Distributed service logic for SCF FE

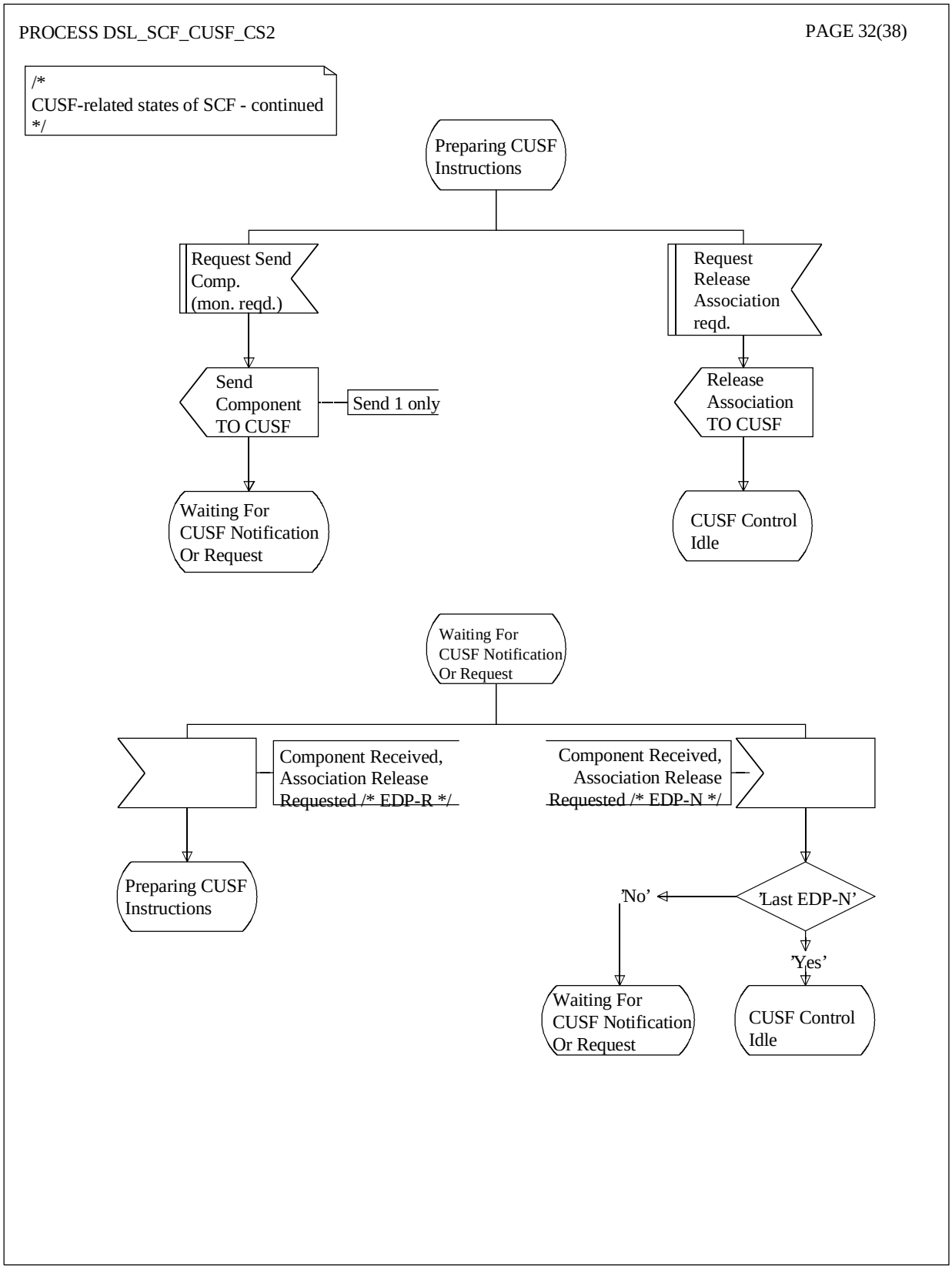

Figure 11-112/Q.1224 (sheet 32 of 38) – Distributed service logic for SCF FE

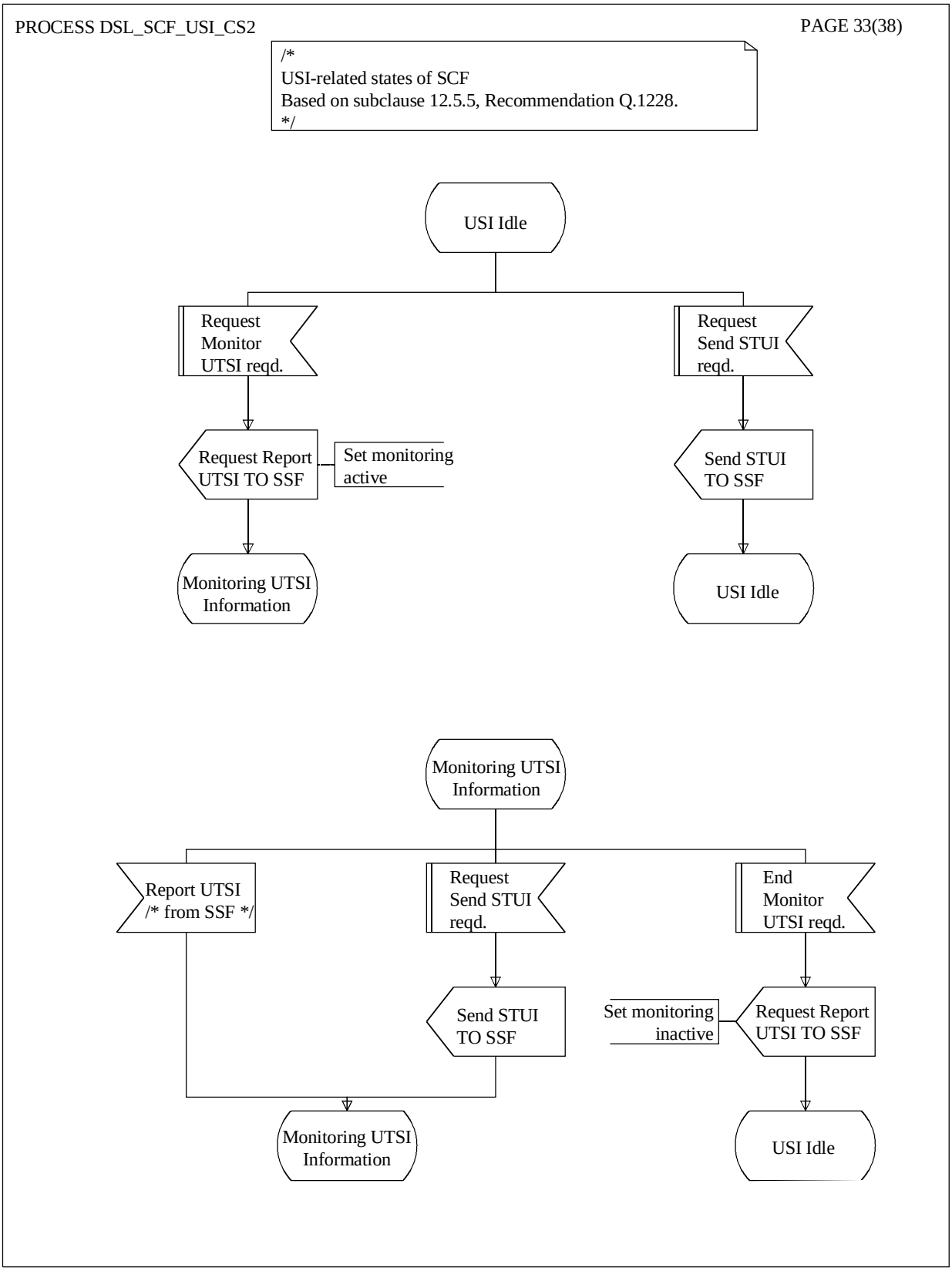

Figure 11-112/Q.1224 (sheet 33 of 38) – Distributed service logic for SCF FE

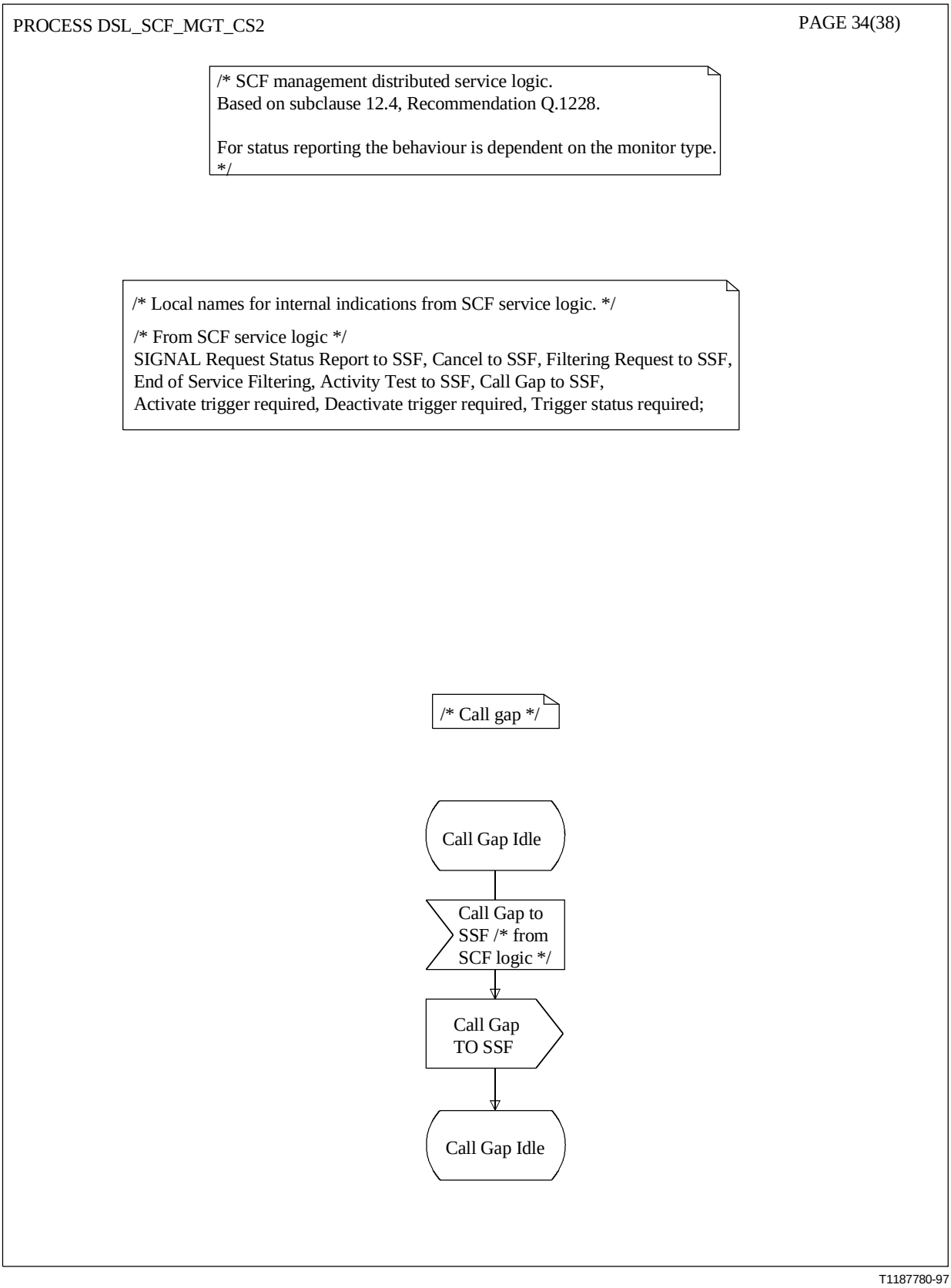

Figure 11-112/Q.1224 (sheet 34 of 38) – Distributed service logic for SCF FE

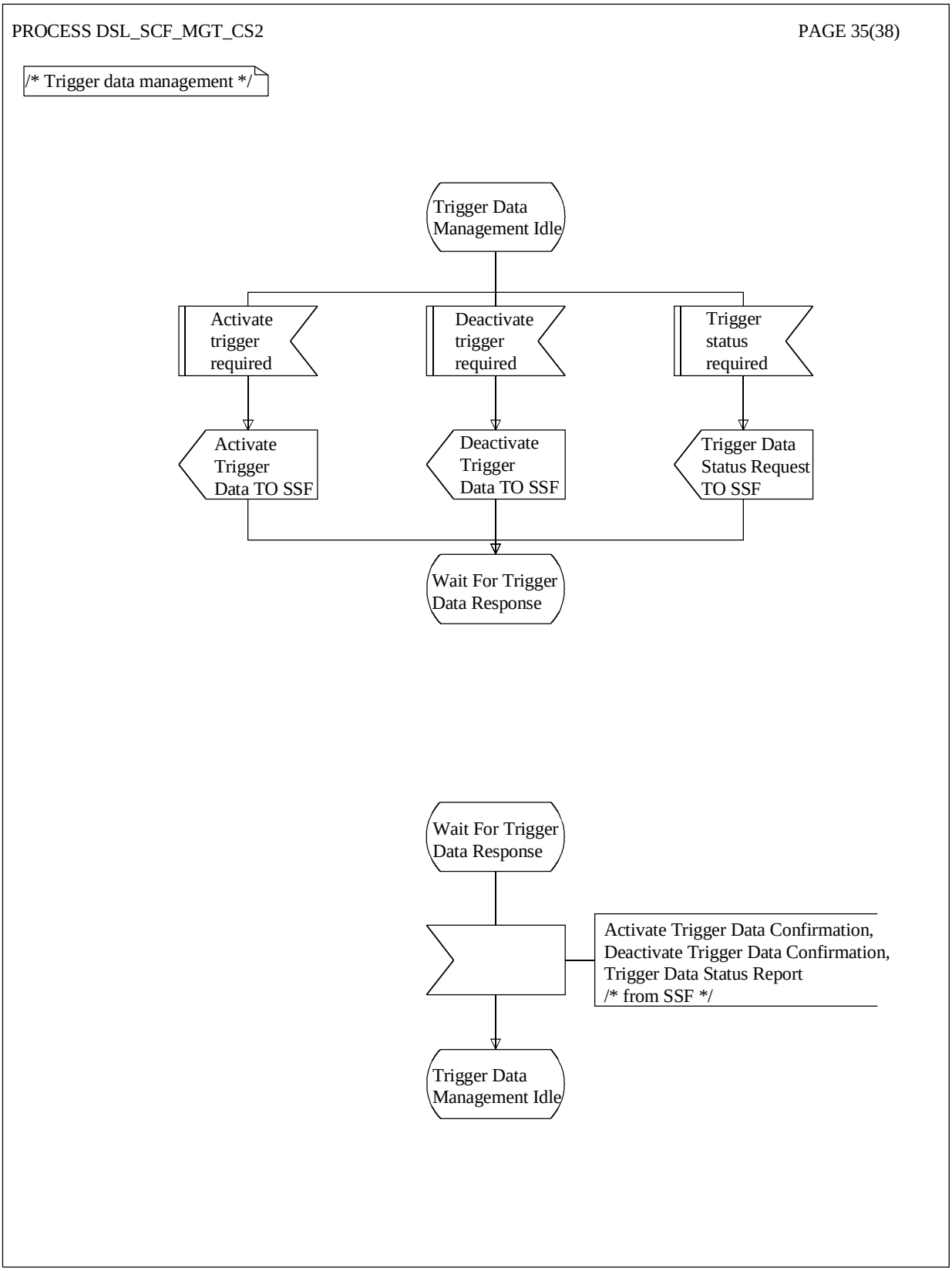

Figure 11-112/Q.1224 (sheet 35 of 38) – Distributed service logic for SCF FE

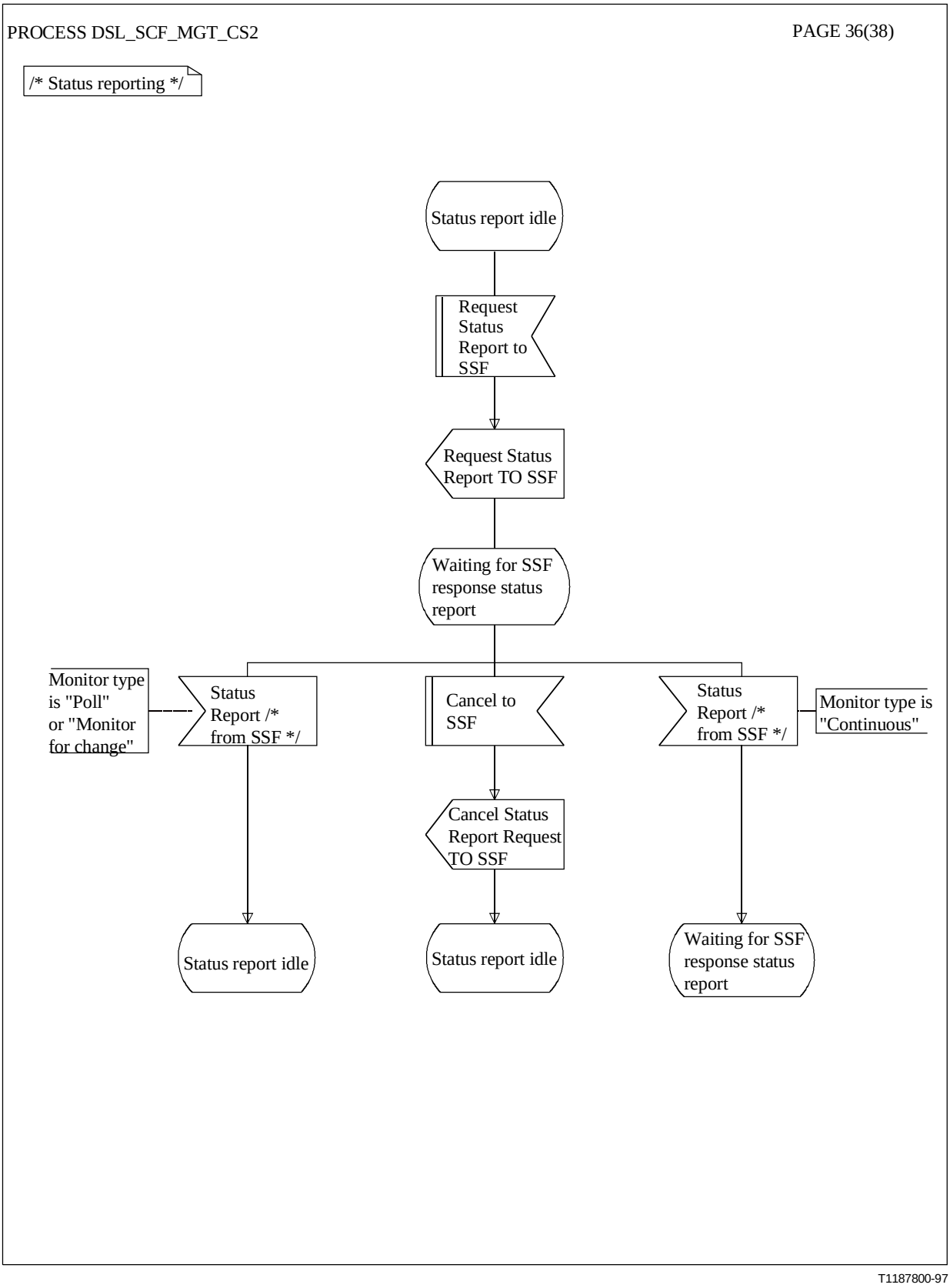

Figure 11-112/Q.1224 (sheet 36 of 38) – Distributed service logic for SCF FE

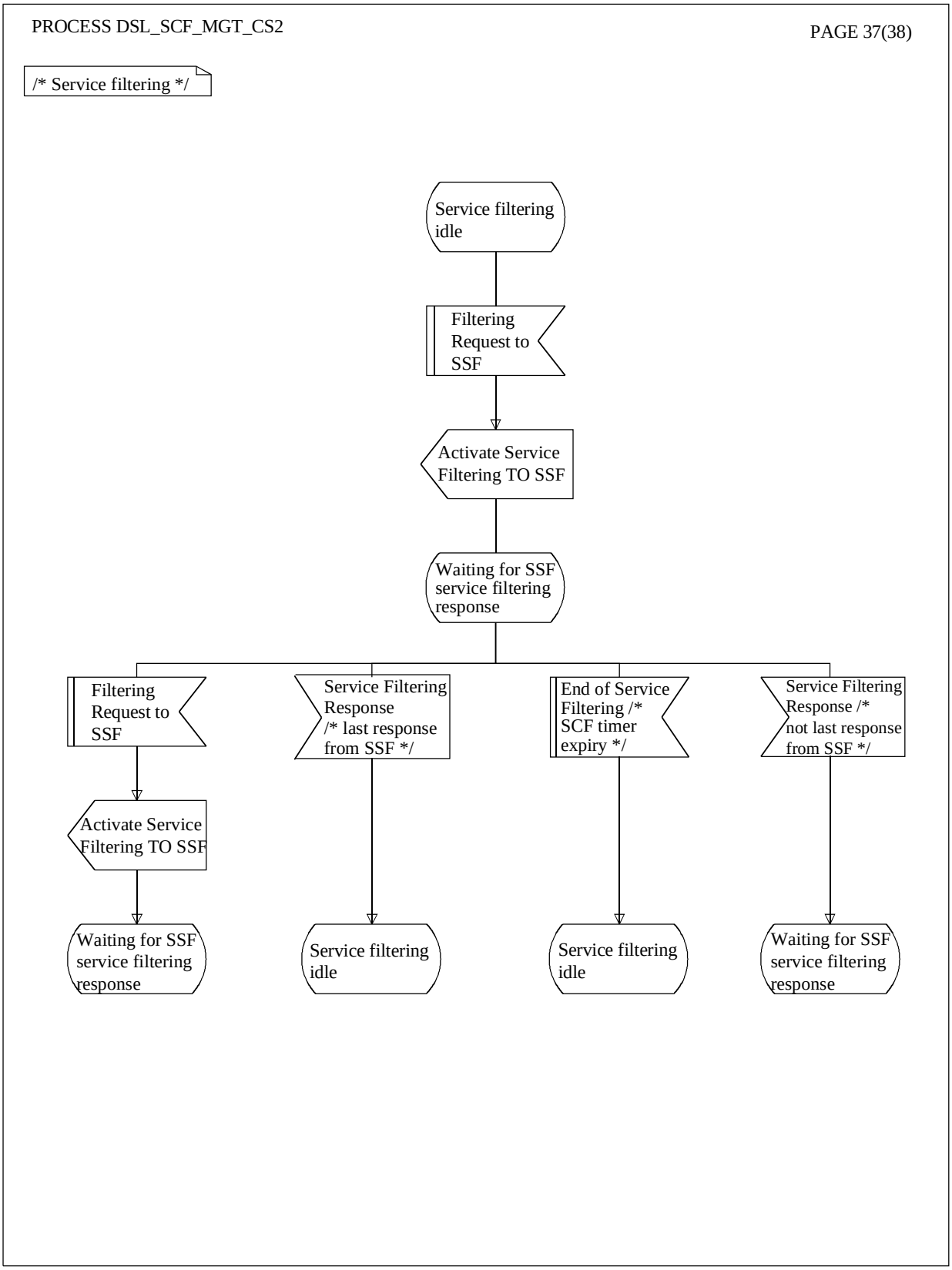

Figure 11-112/Q.1224 (sheet 37 of 38) – Distributed service logic for SCF FE

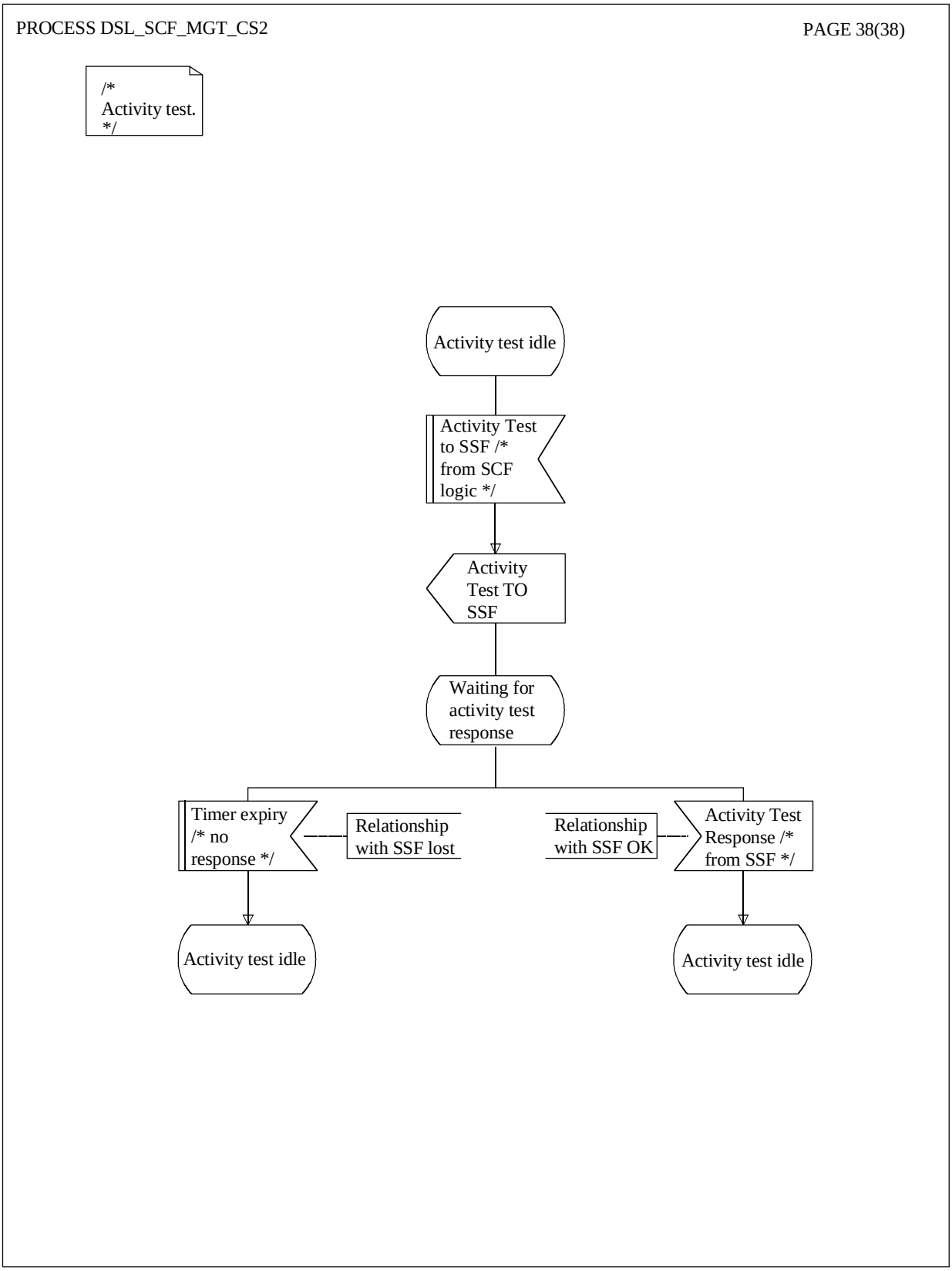

Figure 11-112/Q.1224 (sheet 38 of 38) – Distributed service logic for SCF FE

PROCESS SCF_SCF_CONTROLLING PAGE 1(6)

```
/*
Distributed service logic for SCF-SCF interactions, controlling SCF side.

Based on subclause 12.5.3, Recommendation Q.1228.

SCFc = controlling SCF

SCFs = supporting SCF

*/
```

```
/* Local signal definitions.
These signals from internal SCF logic are internal indications which are not
defined in the IN CS-2 Recommendations.
The names are local names only and are used only to assist specification
of the logic. */

/* From SCFc service logic */
SIGNAL SCF Bind Request required, SCF Bind timer expiry, End assist,
Additional Information to SCFs, Network Capability Result to SCFs, IF to SCFs required,
More information needed from SCFs;
```

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Figure 11-113/Q.1224 (sheet 1 of 6) – Distributed service logic for controlling SCF FE, SCF-SCF interactions

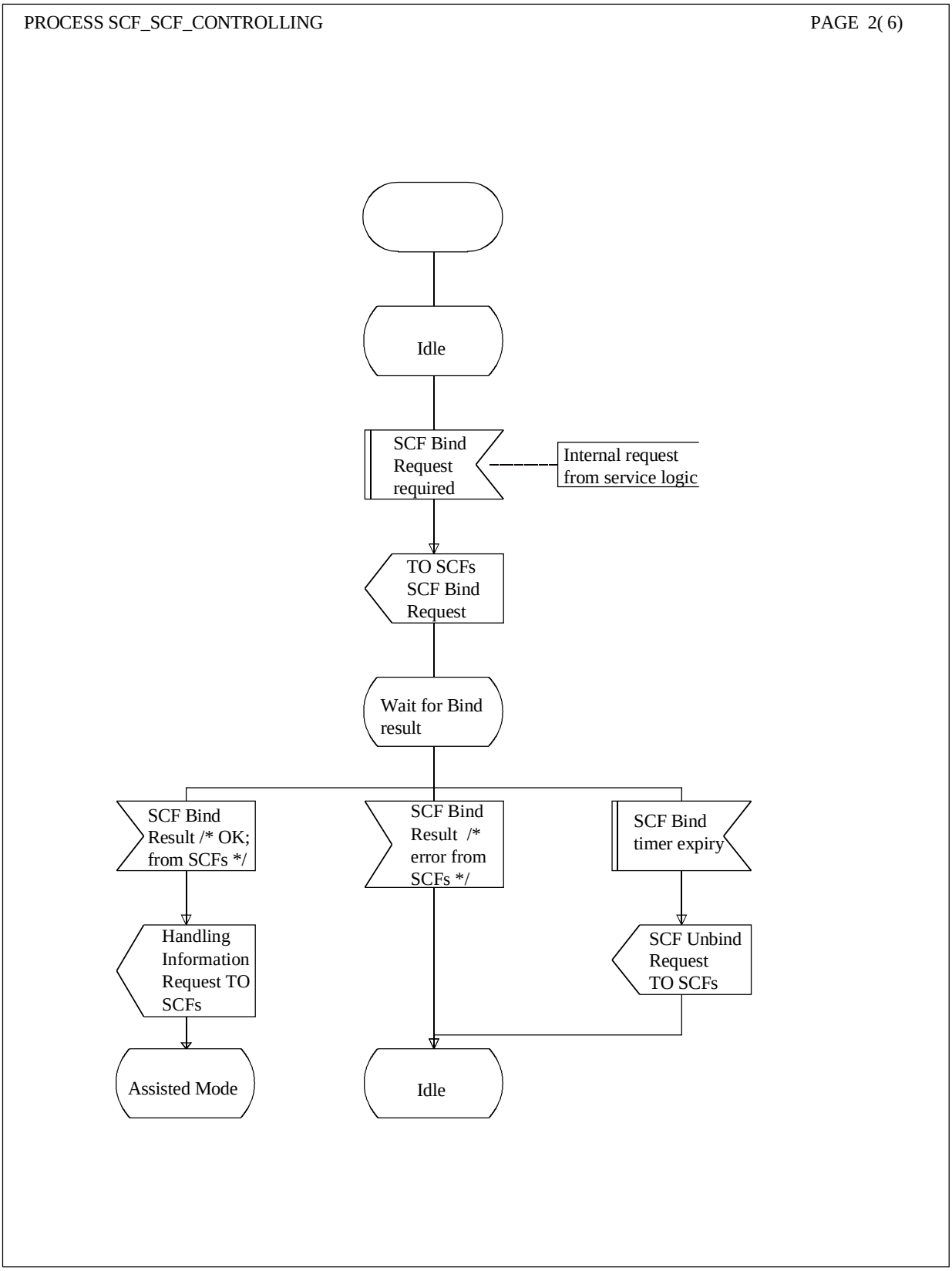

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Figure 11-113/Q.1224 (sheet 2 of 6) – Distributed service logic for controlling SCF FE, SCF-SCF interactions

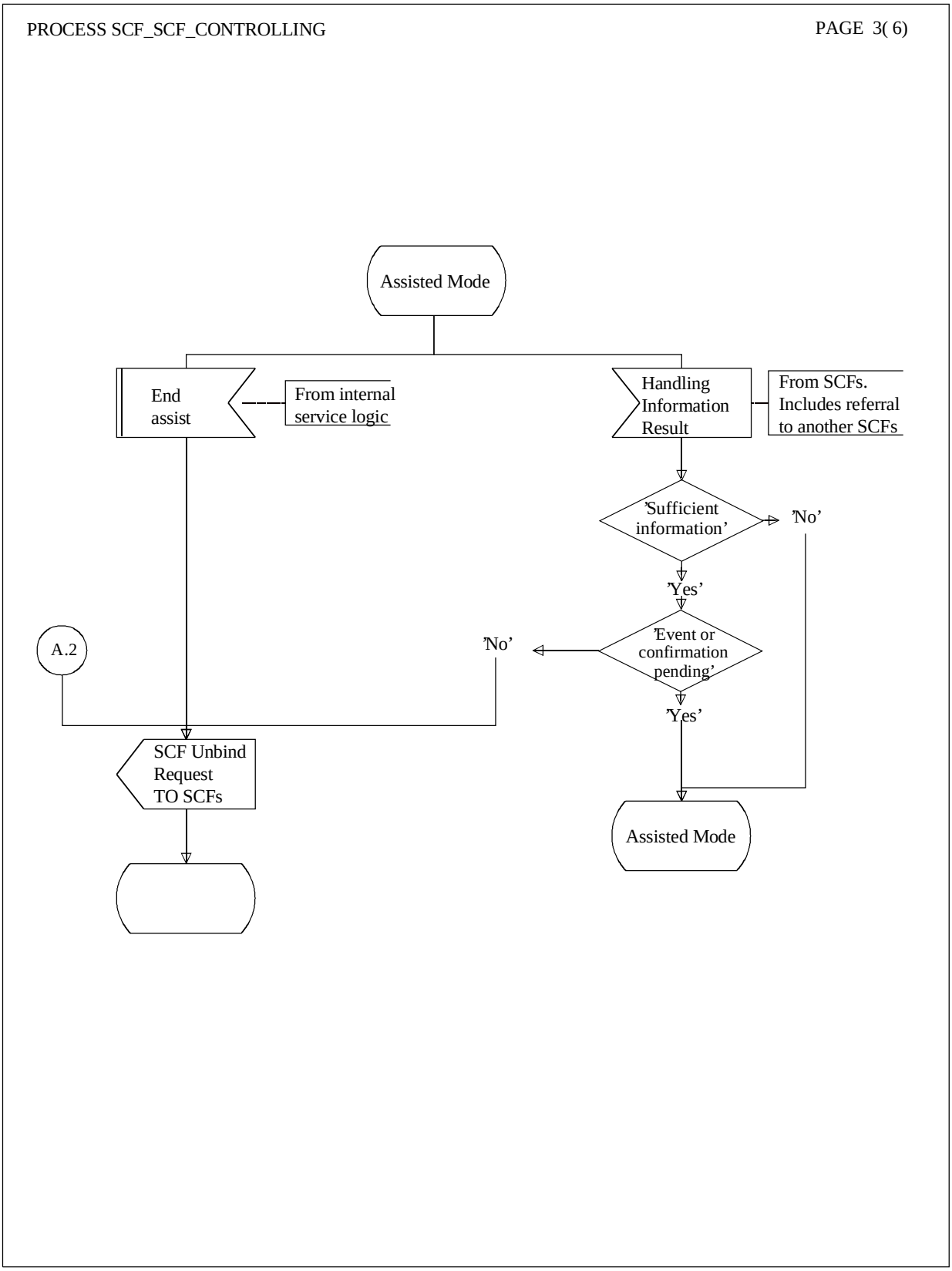

Figure 11-113/Q.1224 (sheet 3 of 6) – Distributed service logic for controlling SCF FE, SCF-SCF interactions

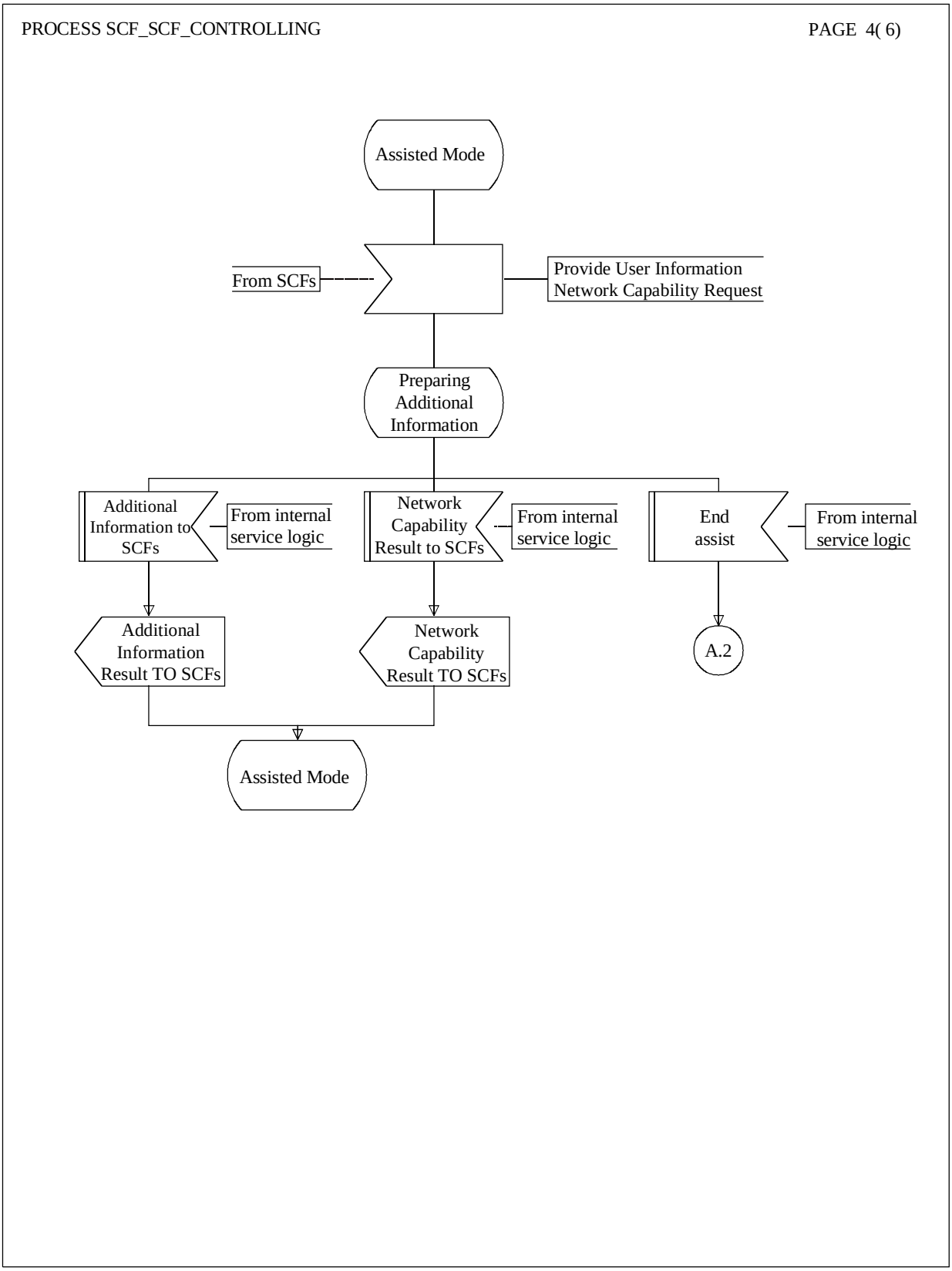

Figure 11-113/Q.1224 (sheet 4 of 6) – Distributed service logic for controlling SCF FE, SCF-SCF interactions

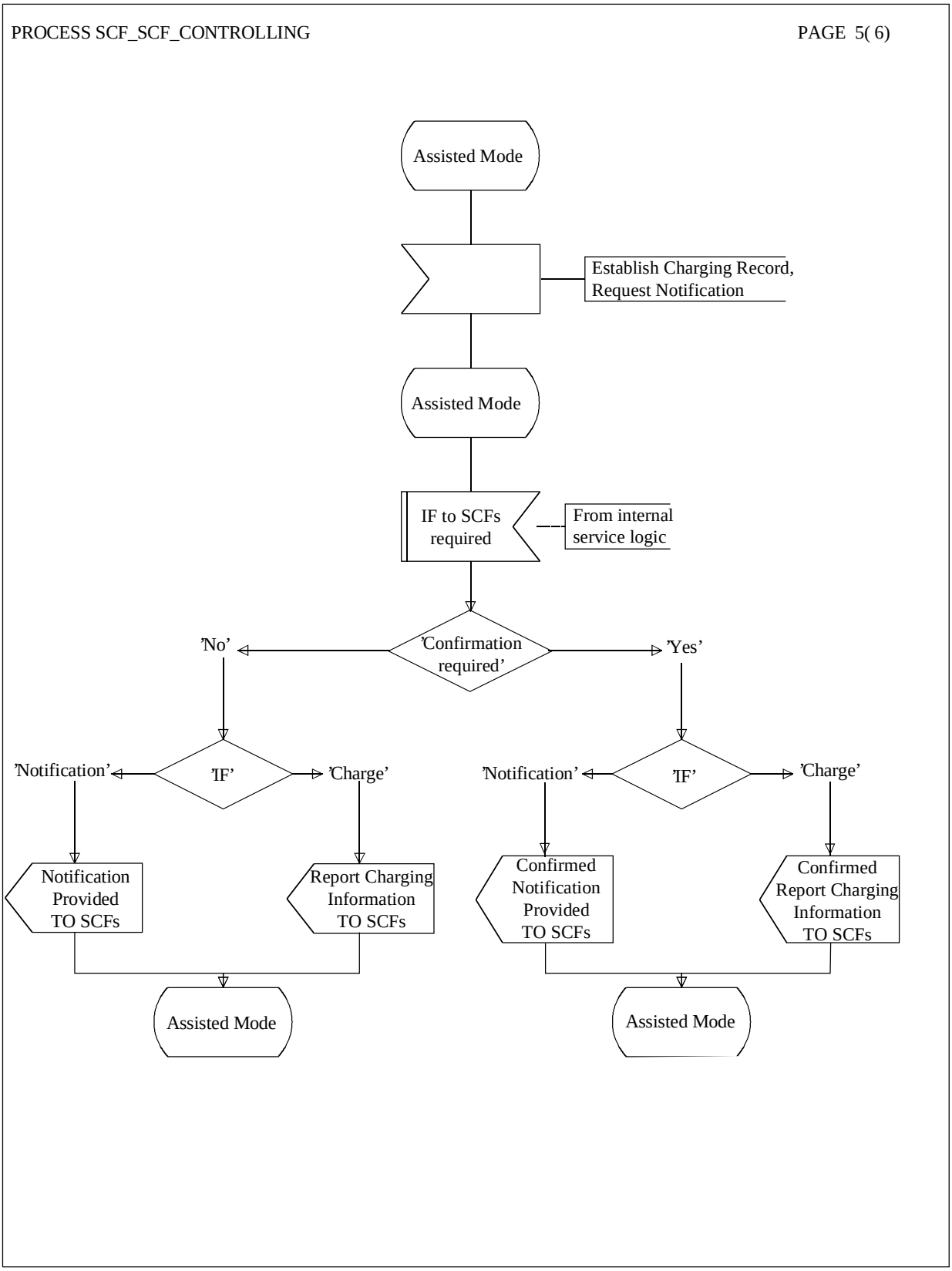

Figure 11-113/Q.1224 (sheet 5 of 6) – Distributed service logic for controlling SCF FE, SCF-SCF interactions

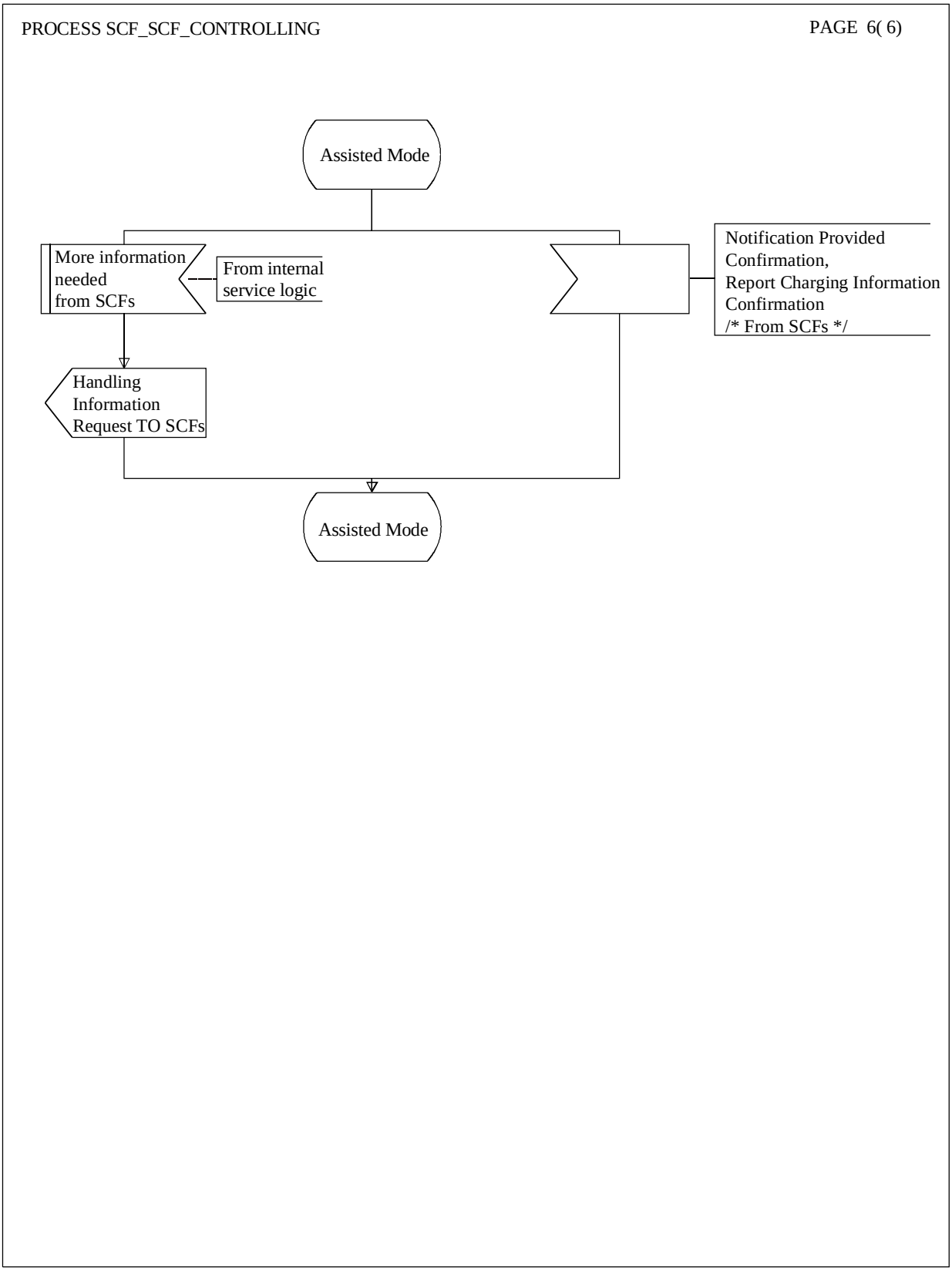

Figure 11-113/Q.1224 (sheet 6 of 6) – Distributed service logic for controlling SCF FE, SCF-SCF interactions

PROCESS SCF_SCF_SUPPORTING PAGE 1(11)

```
/*
Distributed service logic for SCF-SCF interactions, supporting SCF.

Based on subclause 12.5.3, Recommendation Q.1228.

SCFc = controlling SCF
SCFs = supporting SCF

*/
```

```
/* Local signal definitions.
Signals from internal SCF logic. */

/* Internal indications from SCFs service logic */
SIGNAL Bind successful, Bind error, Timer expiry, Assist
provided, Information needed from SCFc, Charging information
 required, Notification required;
```

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Figure 11-114/Q.1224 (sheet 1 of 11) – Distributed service logic for supporting SCF FE, SCF-SCF interactions

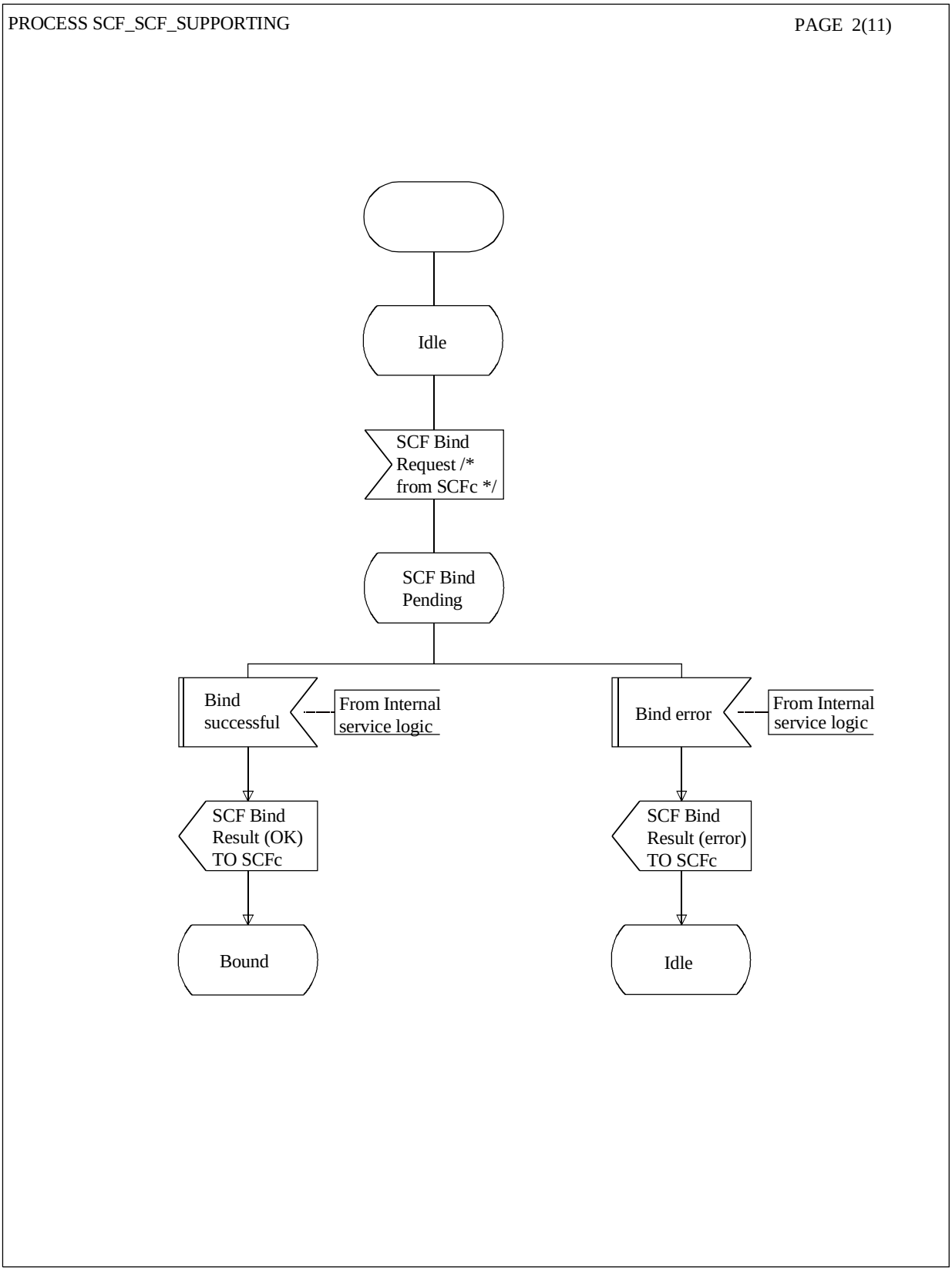

Figure 11-114/Q.1224 (sheet 2 of 11) – Distributed service logic for supporting SCF FE, SCF-SCF interactions

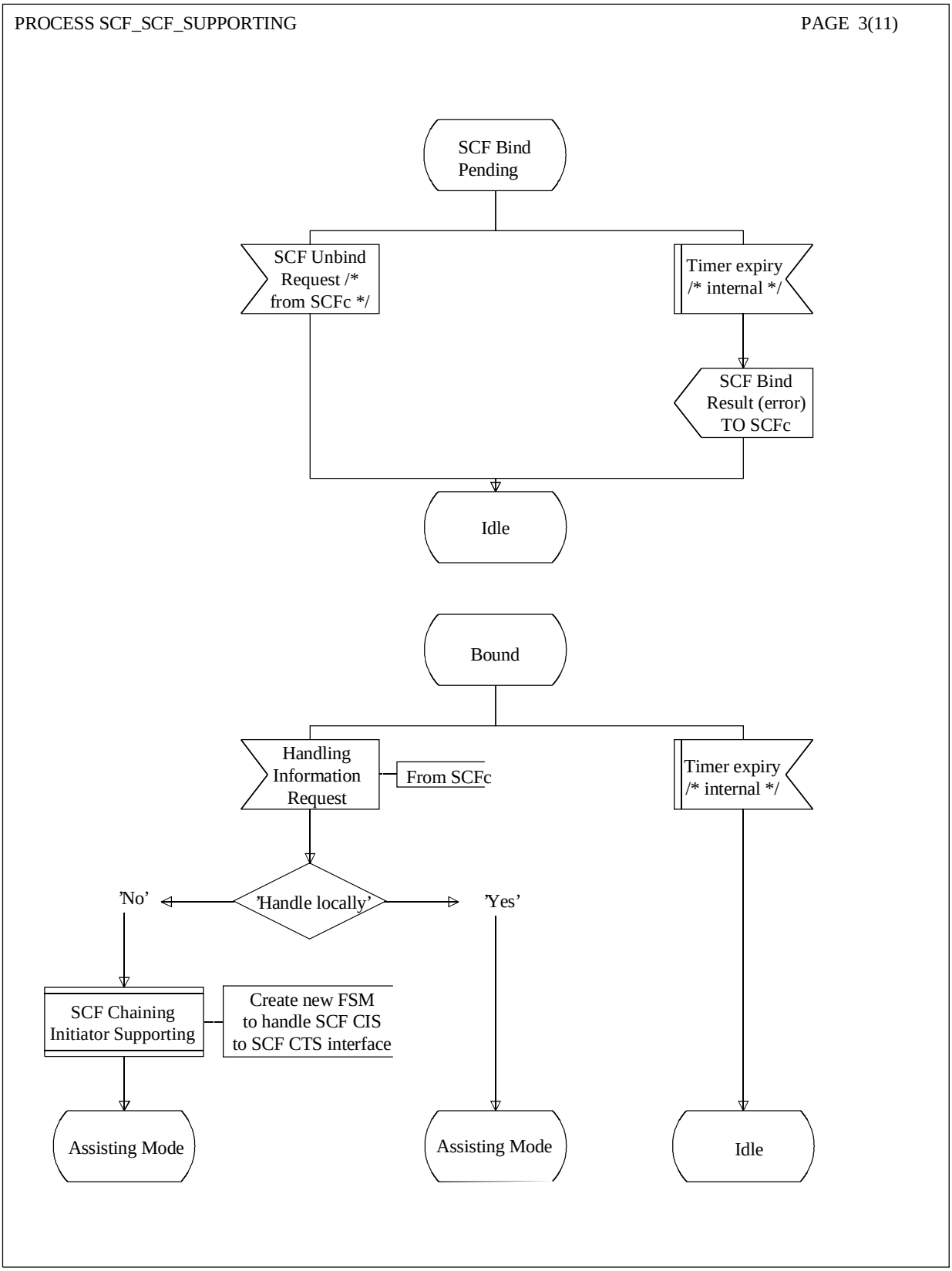

Figure 11-114/Q.1224 (sheet 3 of 11) – Distributed service logic for supporting SCF FE, SCF-SCF interactions

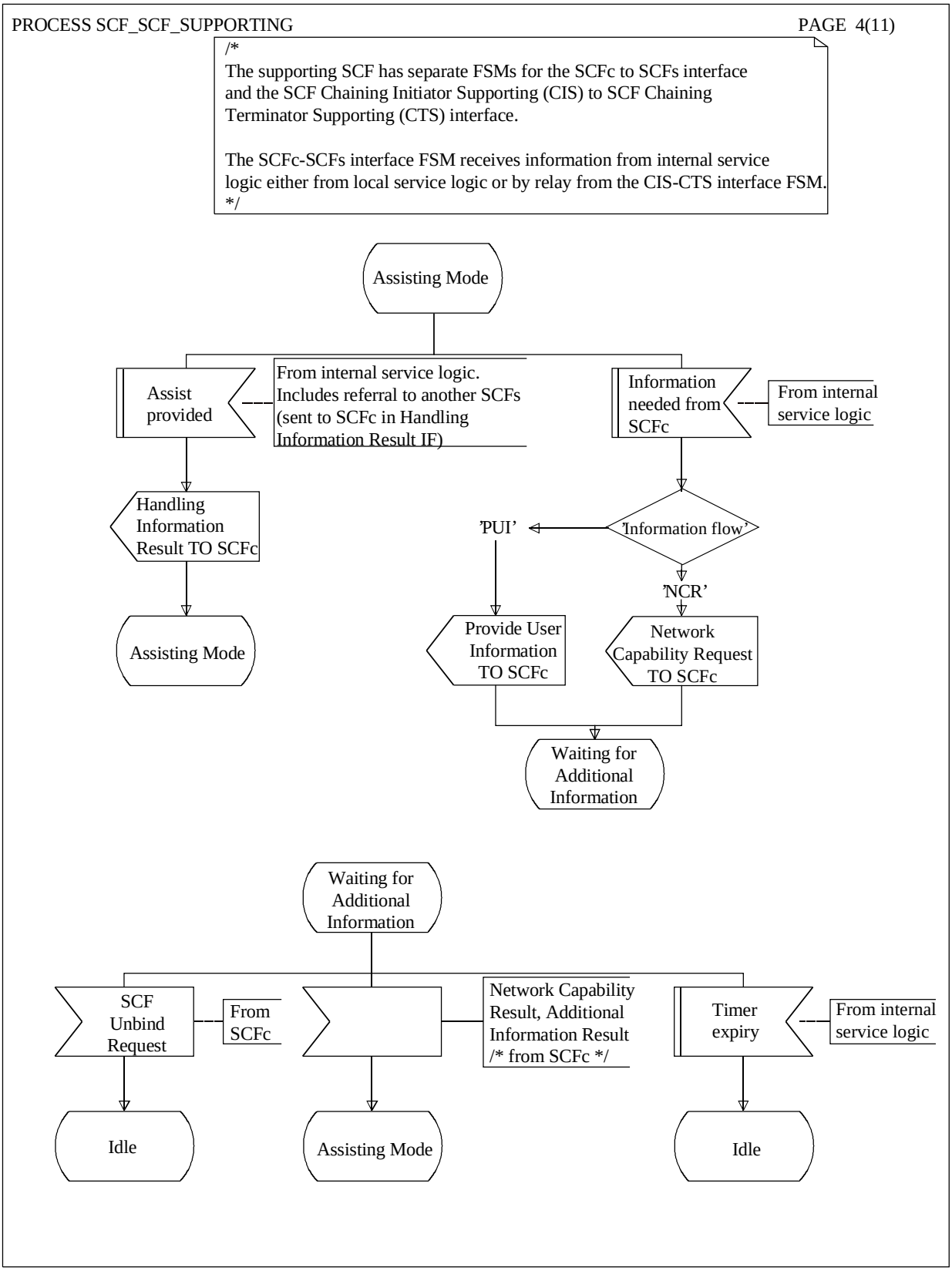

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Figure 11-114/Q.1224 (sheet 4 of 11) – Distributed service logic for supporting SCF FE, SCF-SCF interactions

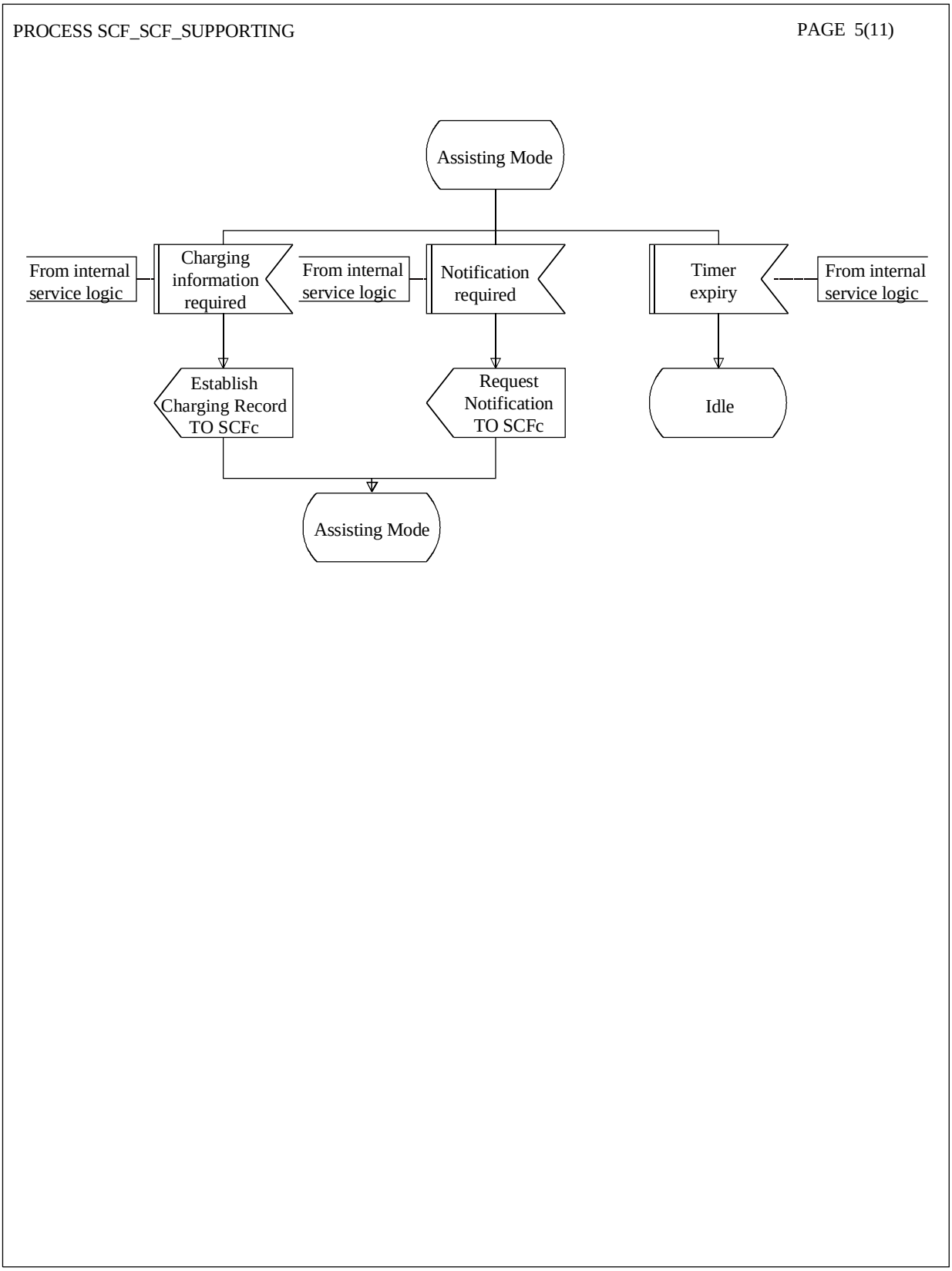

Figure 11-114/Q.1224 (sheet 5 of 11) – Distributed service logic for supporting SCF FE, SCF-SCF interactions

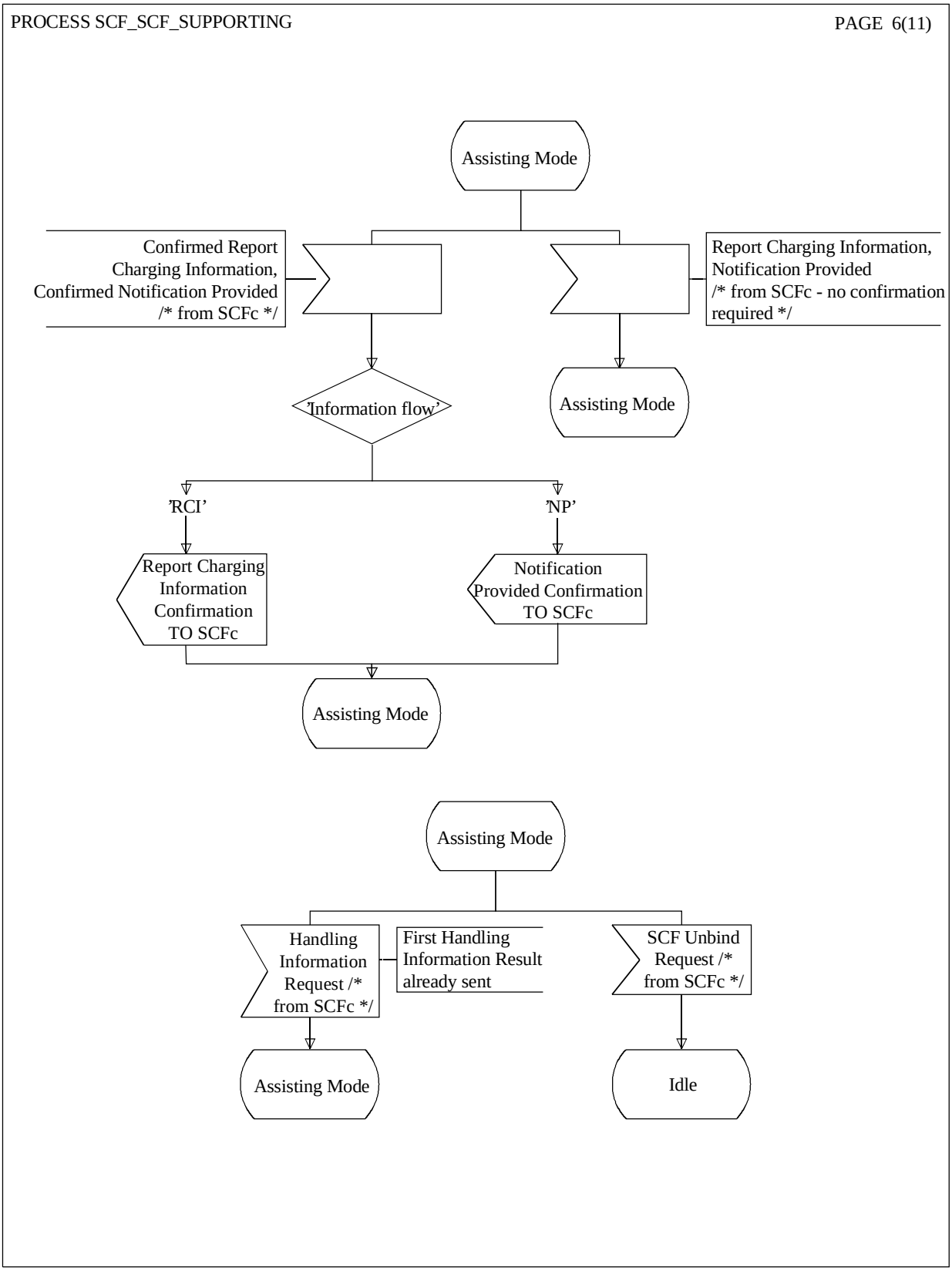

Figure 11-114/Q.1224 (sheet 6 of 11) – Distributed service logic for supporting SCF FE, SCF-SCF interactions

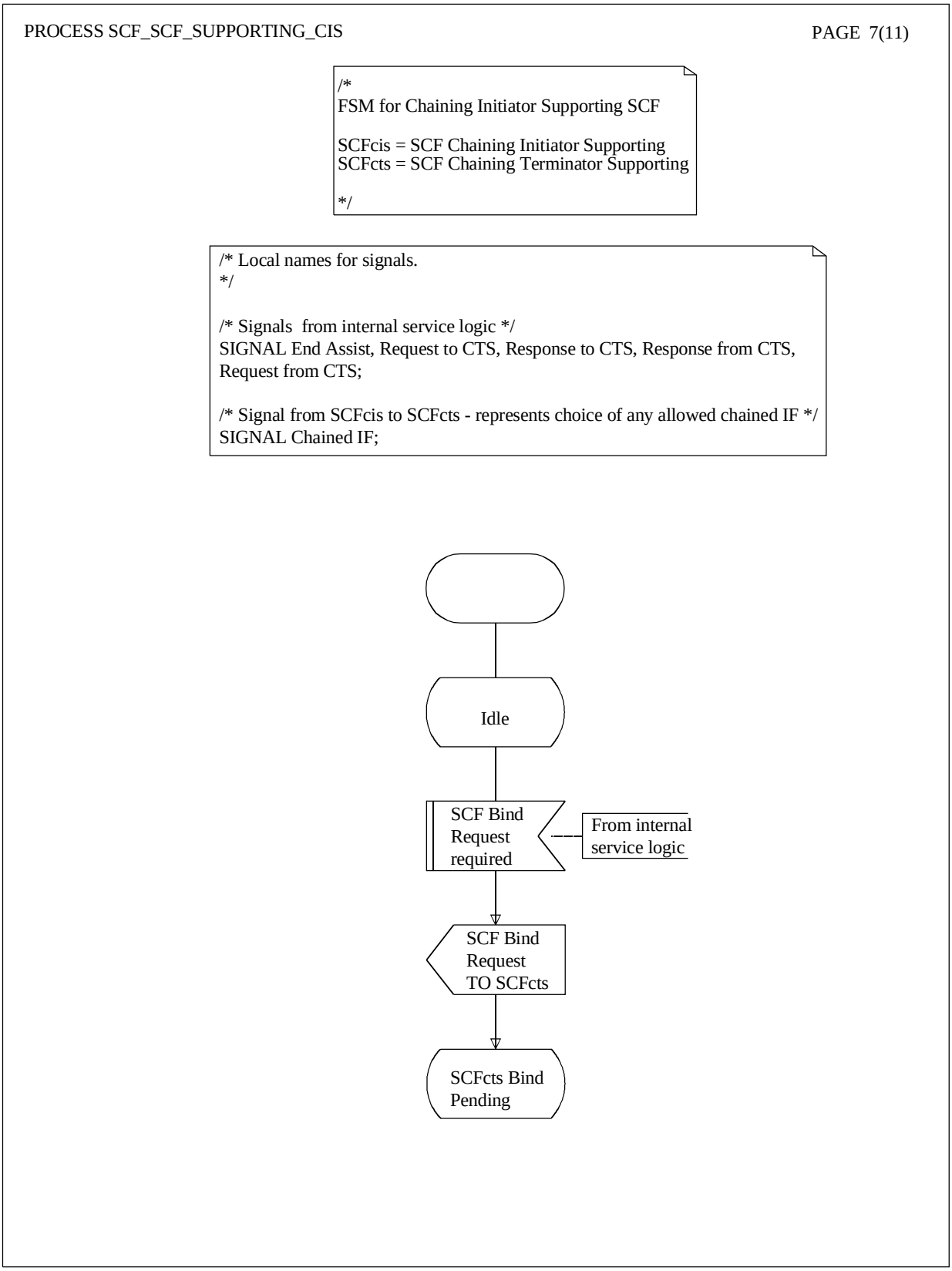

Figure 11-114/Q.1224 (sheet 7 of 11) – Distributed service logic for supporting SCF FE, SCF-SCF interactions

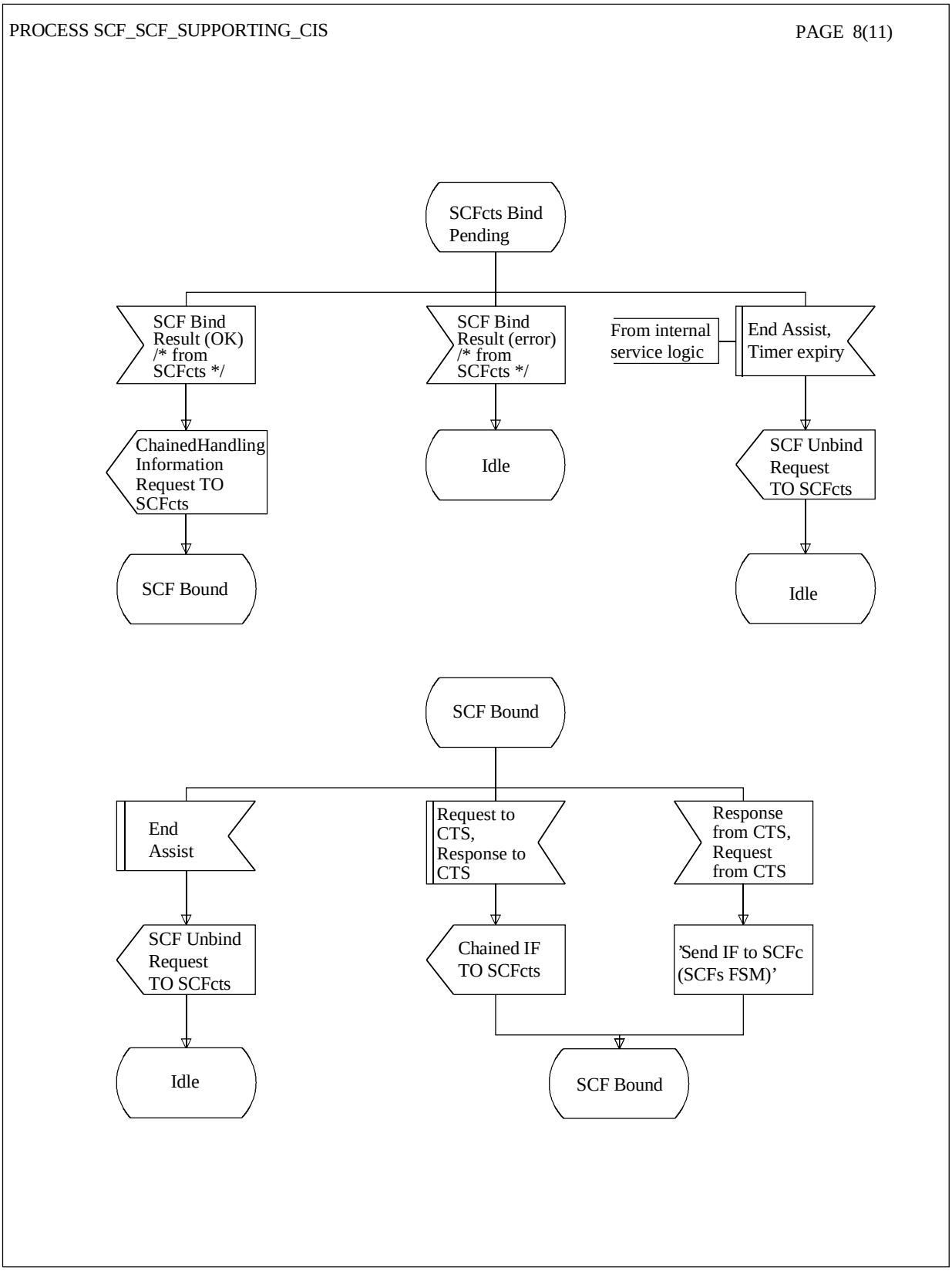

Figure 11-114/Q.1224 (sheet 8 of 11) – Distributed service logic for supporting SCF FE, SCF-SCF interactions

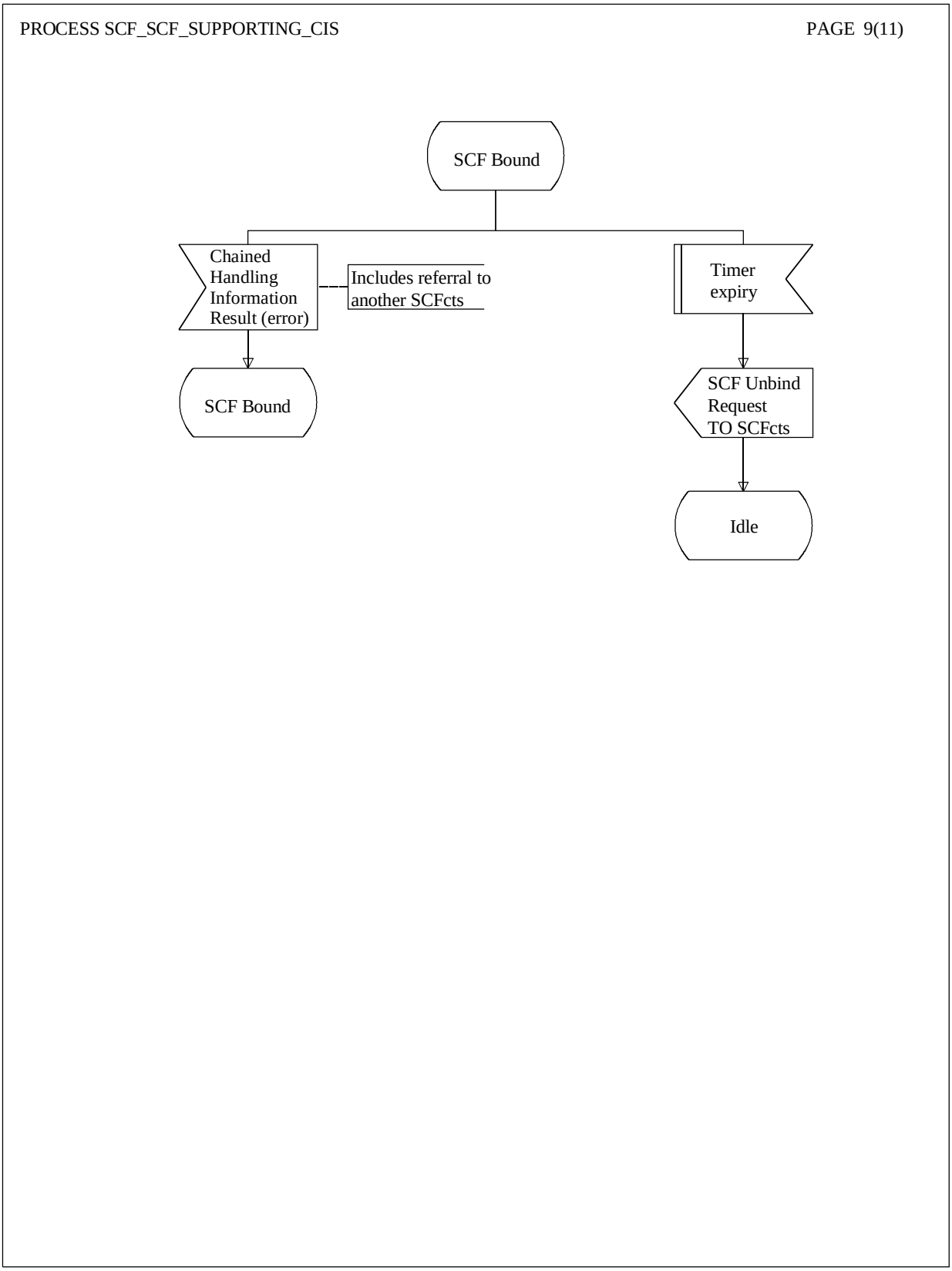

Figure 11-114/Q.1224 (sheet 9 of 11) – Distributed service logic for supporting SCF FE, SCF-SCF interactions

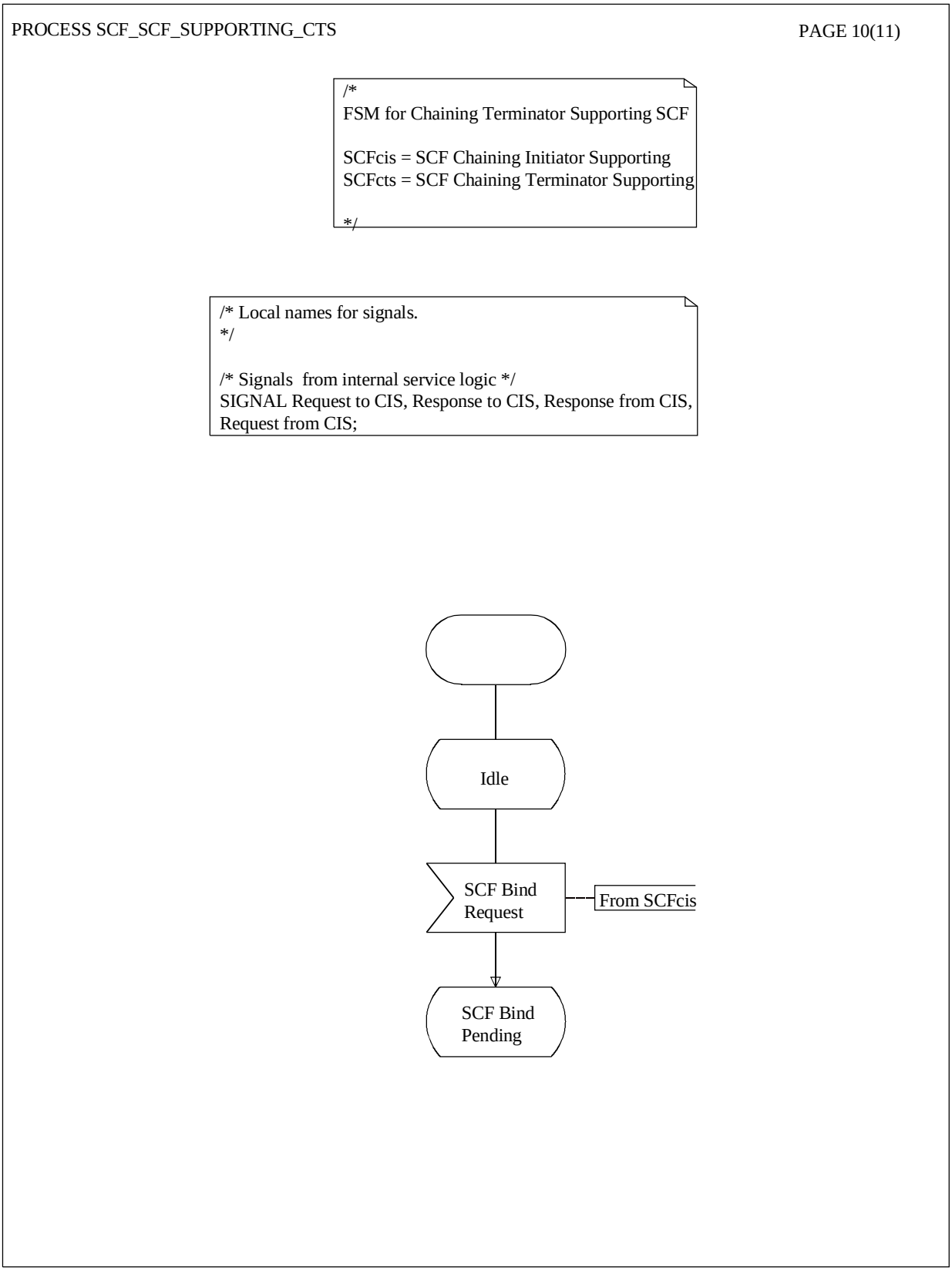

Figure 11-114/Q.1224 (sheet 10 of 11) – Distributed service logic for supporting SCF FE, SCF-SCF interactions

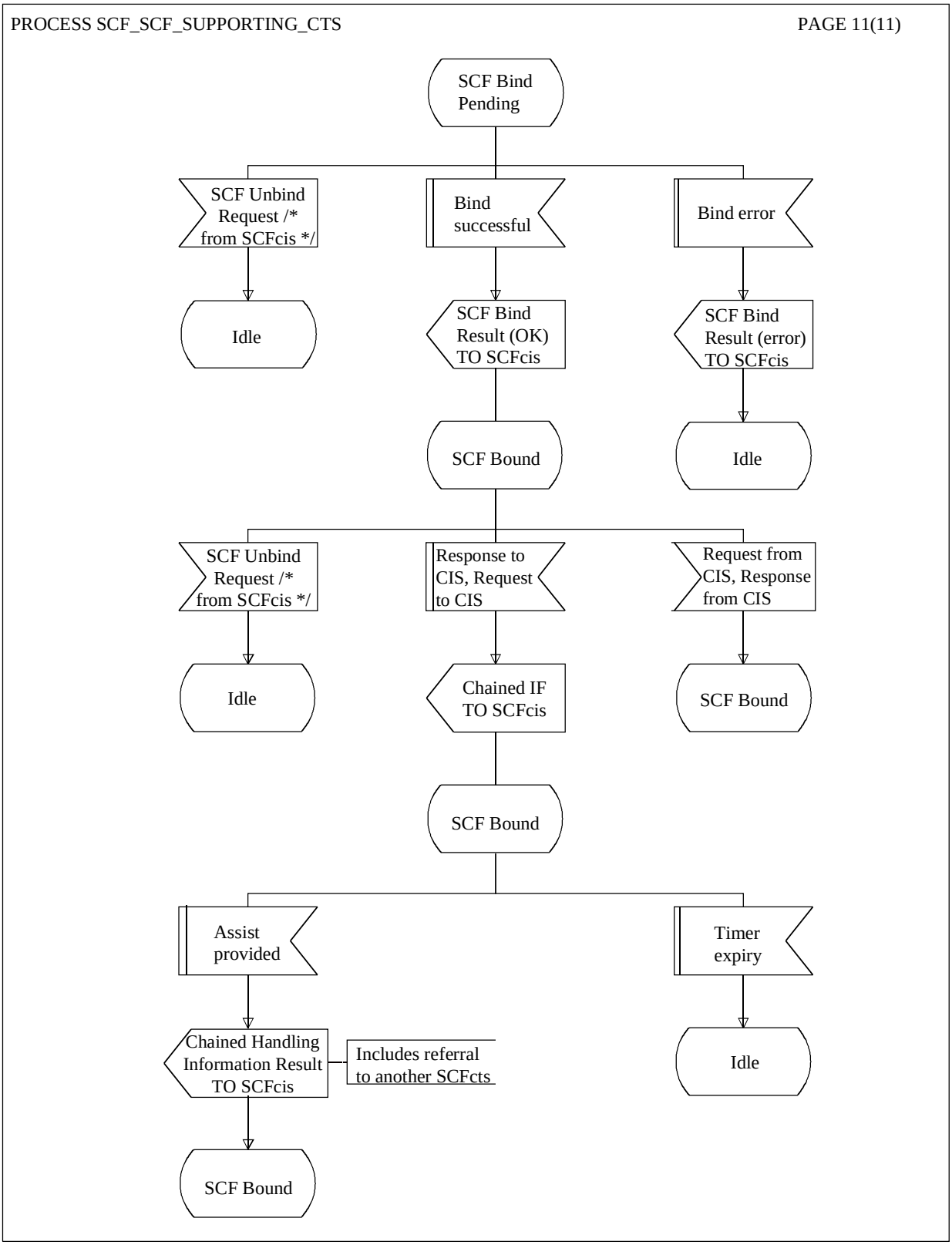

Figure 11-114/Q.1224 (sheet 11 of 11) – Distributed service logic for supporting SCF FE, SCF-SCF interactions

11.5.6 Distributed service logic for SDF

Figure 11-115 contains the SDL diagrams describing the distributed service logic for the SDF, for the SCF-SDF interface. Figure 11-116 contains the SDL diagrams describing the distributed service logic for the SDF, for the SDF-SDF interface, for chained information flows.

PROCESS DSL_SDF_CS2 PAGE 1(3)

```
/*
Distributed service logic for SDF
Based on subclause 14.4, Recommendation Q.1228.

For the distributed service logic, the term "Bind" in INAP on the SCF-SDF interface
is replaced with "Authenticate". The names of the internal events and SDL states
have been changed to reflect this difference.

*/
```

```
/* Local names for signals.
*/

/* From SDF internal logic */
SIGNAL Authenticate Error, Authenticate Successful, Response to SDF;

/* Local name to indicate selection from a list of information flows named in
a comment attached to the signal. */
SIGNAL Inf. Flow;
```

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Figure 11-115/Q.1224 (sheet 1 of 3) – Distributed service logic for SDF FE, SCF-SDF interface

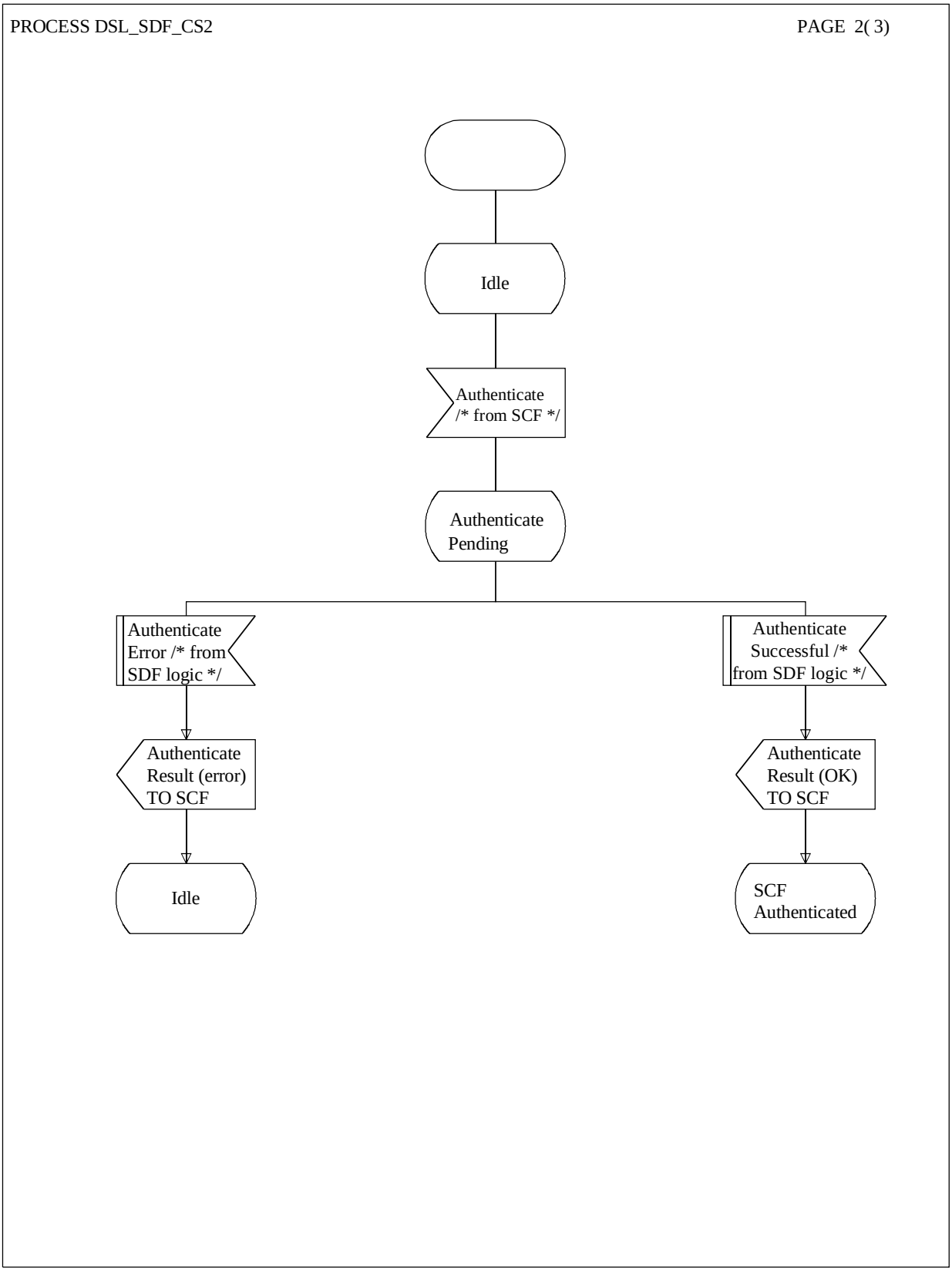

Figure 11-115/Q.1224 (sheet 2 of 3) – Distributed service logic for SDF FE, SCF-SDF interface

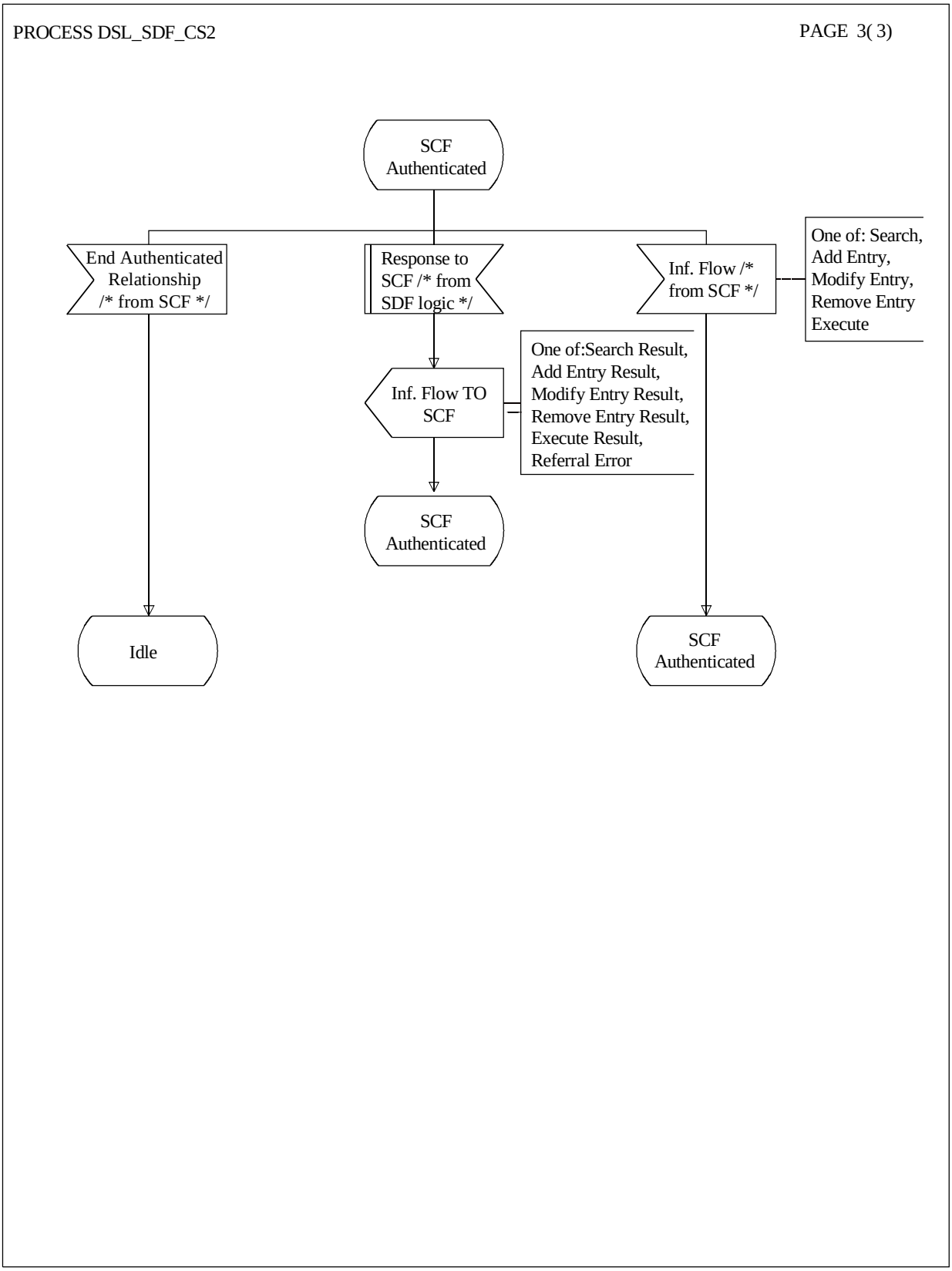

Figure 11-115/Q.1224 (sheet 3 of 3) – Distributed service logic for SDF FE, SCF-SDF interface

PROCESS SDF_SDF_CHAINING PAGE 1(5)

```
/* Distributed service logic for SDF-SDF chaining initiator and terminator
Based on subclause 14.4.2.2, Recommendation Q.1228.

SDF-ChI = chaining initiator
SDF-ChT = chaining terminator

*/
```

```
/* Local signal names */

/* From internal SDF logic */
SIGNAL Authenticate required, End authentication required, Chaining request required,
Authenticate error, Authenticate success, Response required;

/* Chaining Request and Chaining Result are generic names used to represent one of

Chained Search and Chained Search Result
Chained Modify Entry and Chained Modify Entry Result
Chained Add Entry and Chained Add Entry Result
Chained Remove Entry and Chained Remove Entry Result
*/
```

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Figure 11-116/Q.1224 (sheet 1 of 5) – Distributed service logic for SDF FE, chaining of information flows

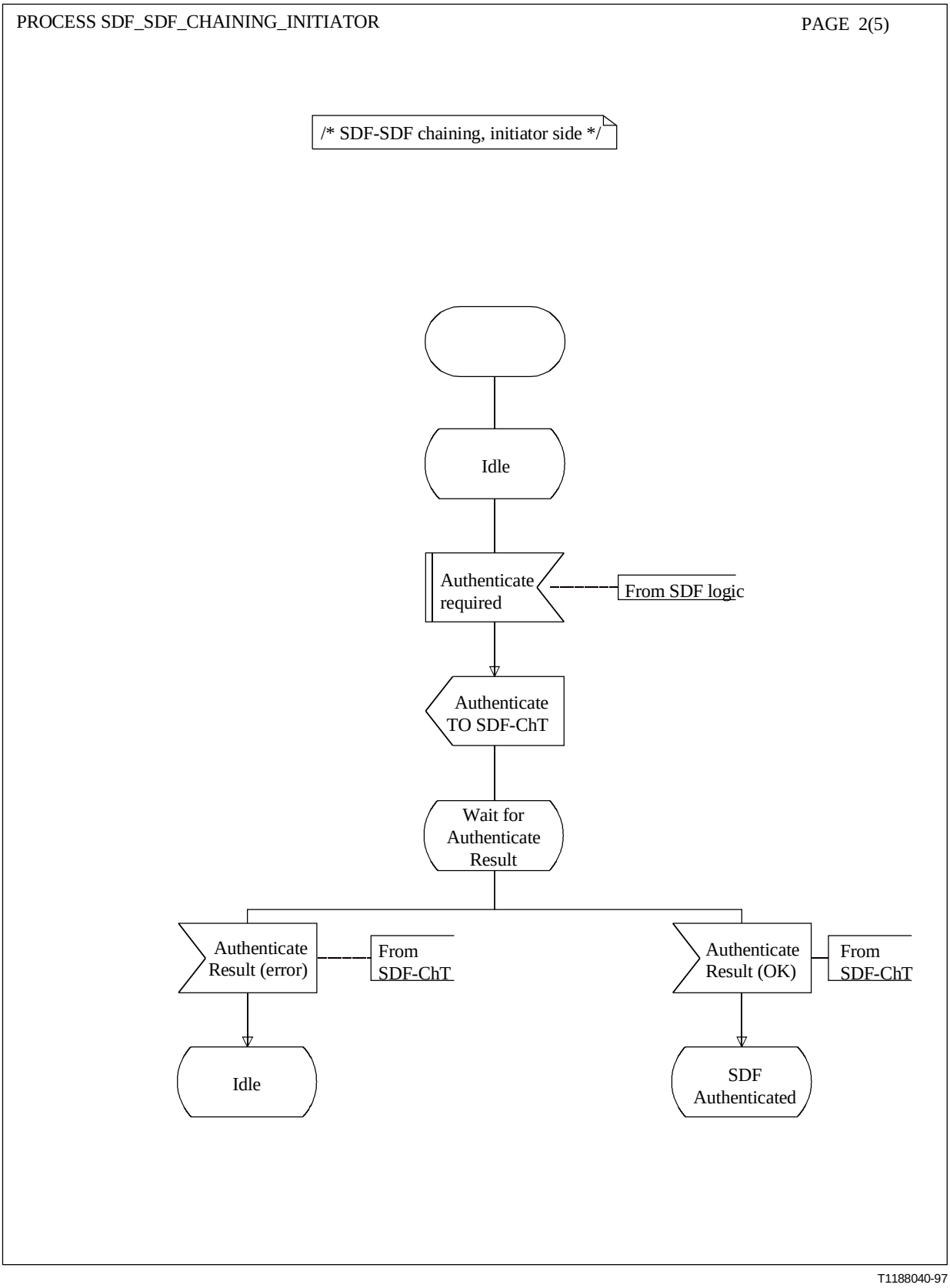

Figure 11-116/Q.1224 (sheet 2 of 5) – Distributed service logic for SDF FE, chaining of information flows

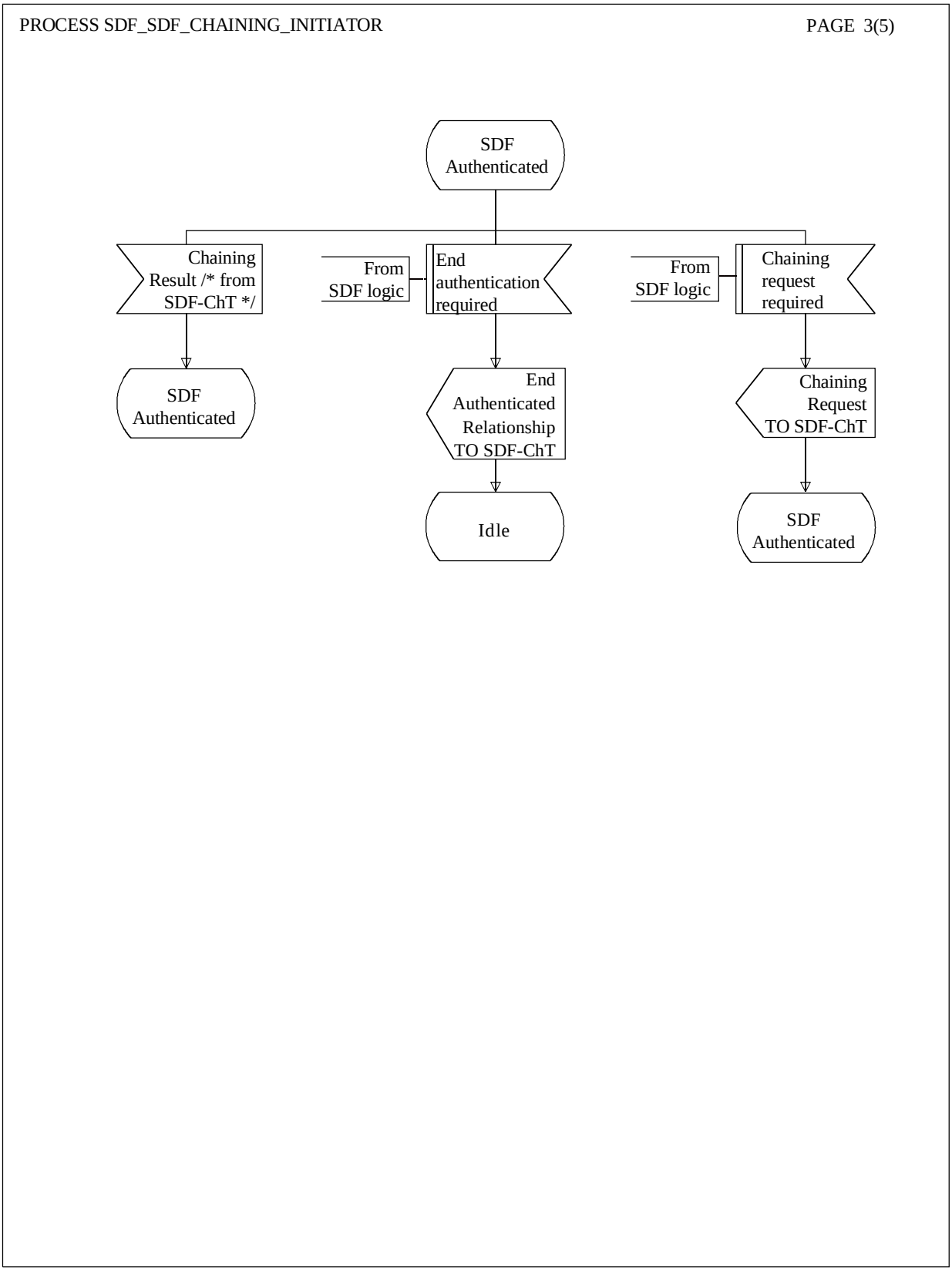

Figure 11-116/Q.1224 (sheet 3 of 5) – Distributed service logic for SDF FE, chaining of information flows

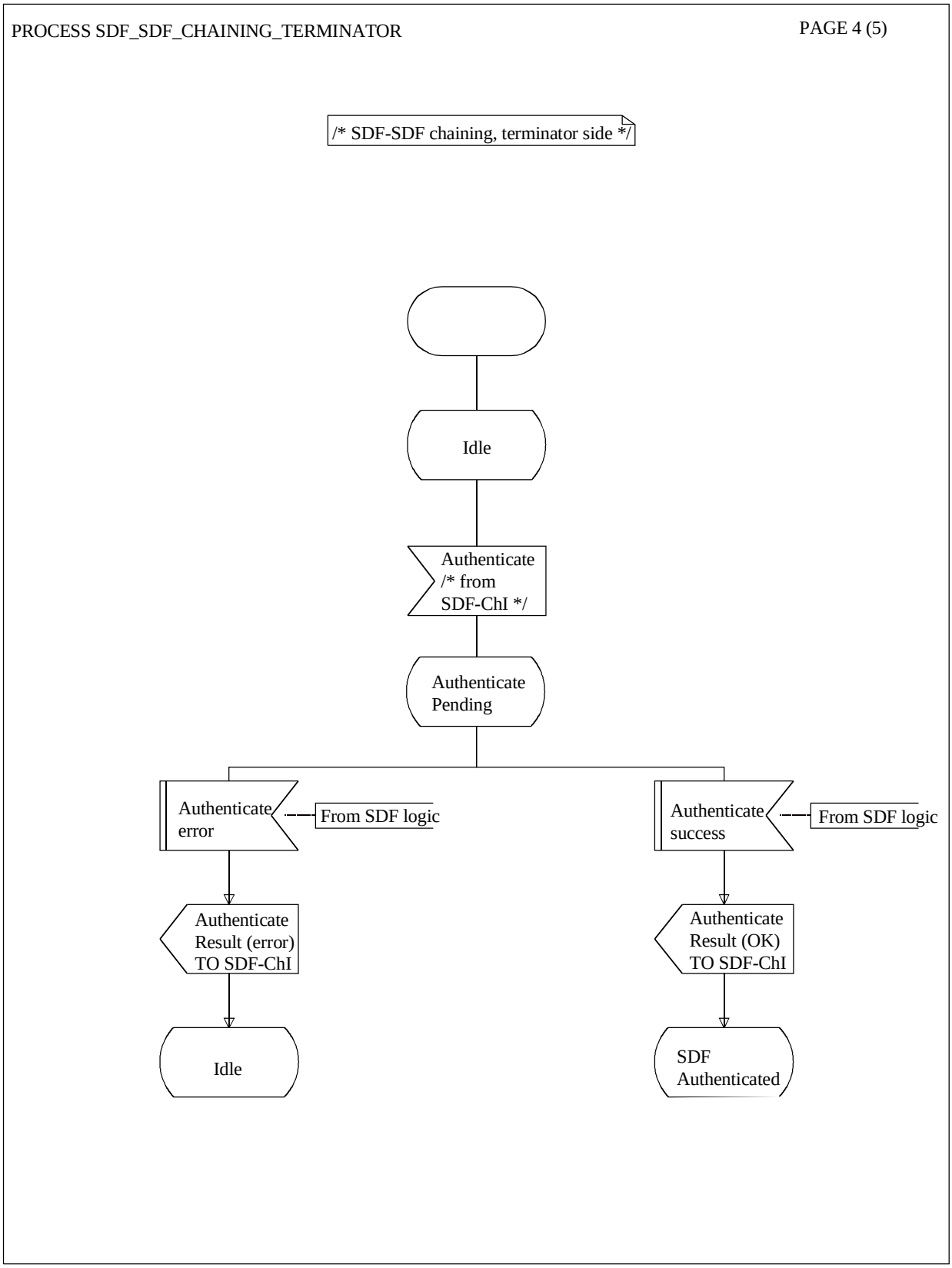

Figure 11-116/Q.1224 (sheet 4 of 5) – Distributed service logic for SDF FE, chaining of information flows

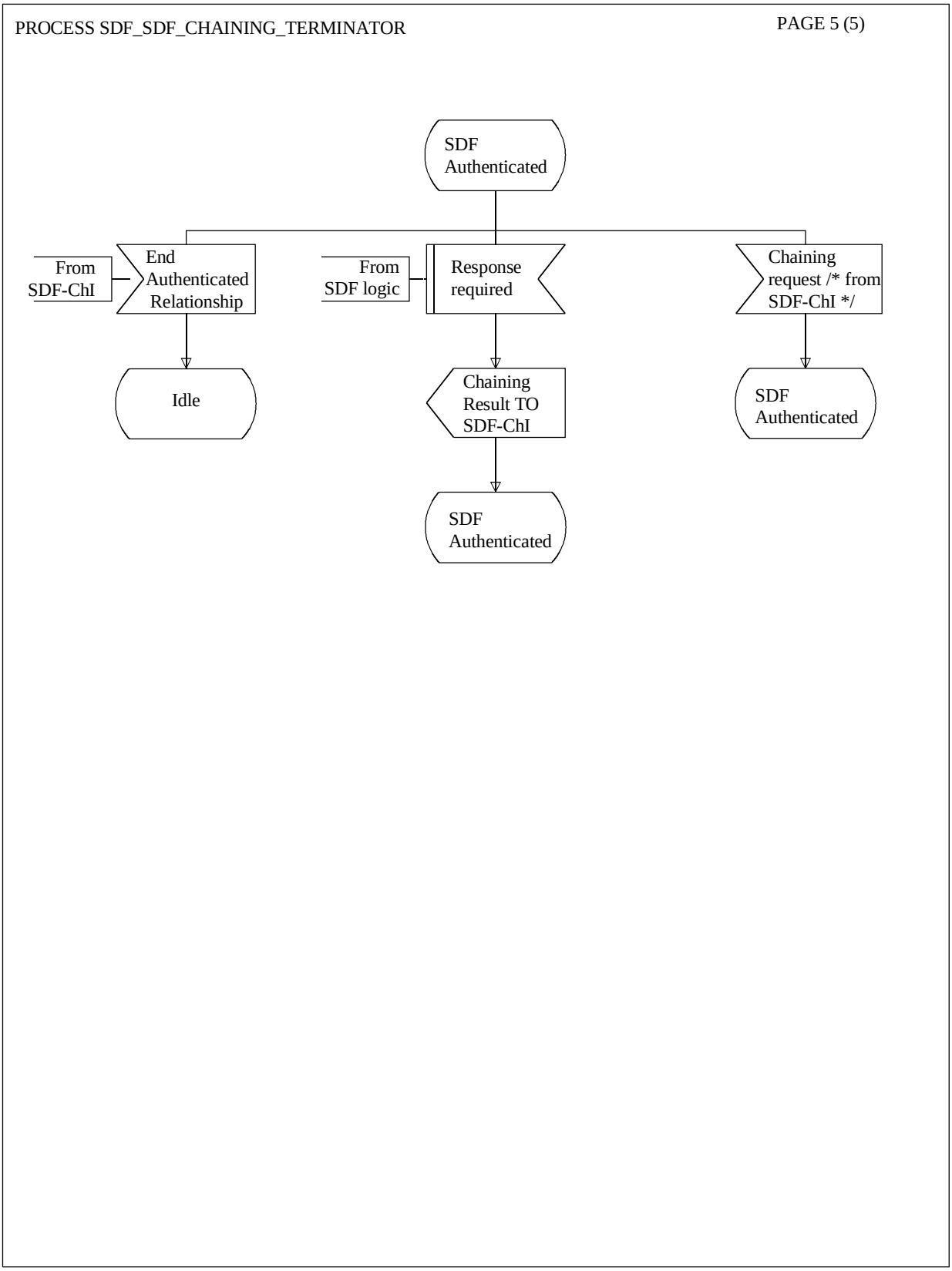

Figure 11-116/Q.1224 (sheet 5 of 5) – Distributed service logic for SDF FE, chaining of information flows

11.5.7 Distributed service logic for CUSF

Figure 11-117 contains the SDL diagrams describing the distributed service logic for the CUSF.

PROCESS DSL_CUSF_CS2 PAGE 1 (4)

```
/*
Distributed service logic for CUSF.
Based on subclause 15.5, Recommendation Q.1228.

*/
```

```
/* Local signal definitions */

/* From CUSF logic */
SIGNAL TDP-R, TDP-N, Release from user, EDP-R, EDP-N;

/* Local name for DP-specific signals from CUSF to SCF */
SIGNAL DP-specific IF;

/* DP-specific IF (from CUSF to SCF) is one of:
Activation Received and Authorized, Association Release Requested,
Component Received
```

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Figure 11-117/Q.1224 (sheet 1 of 4) – Distributed service logic for CUSF FE

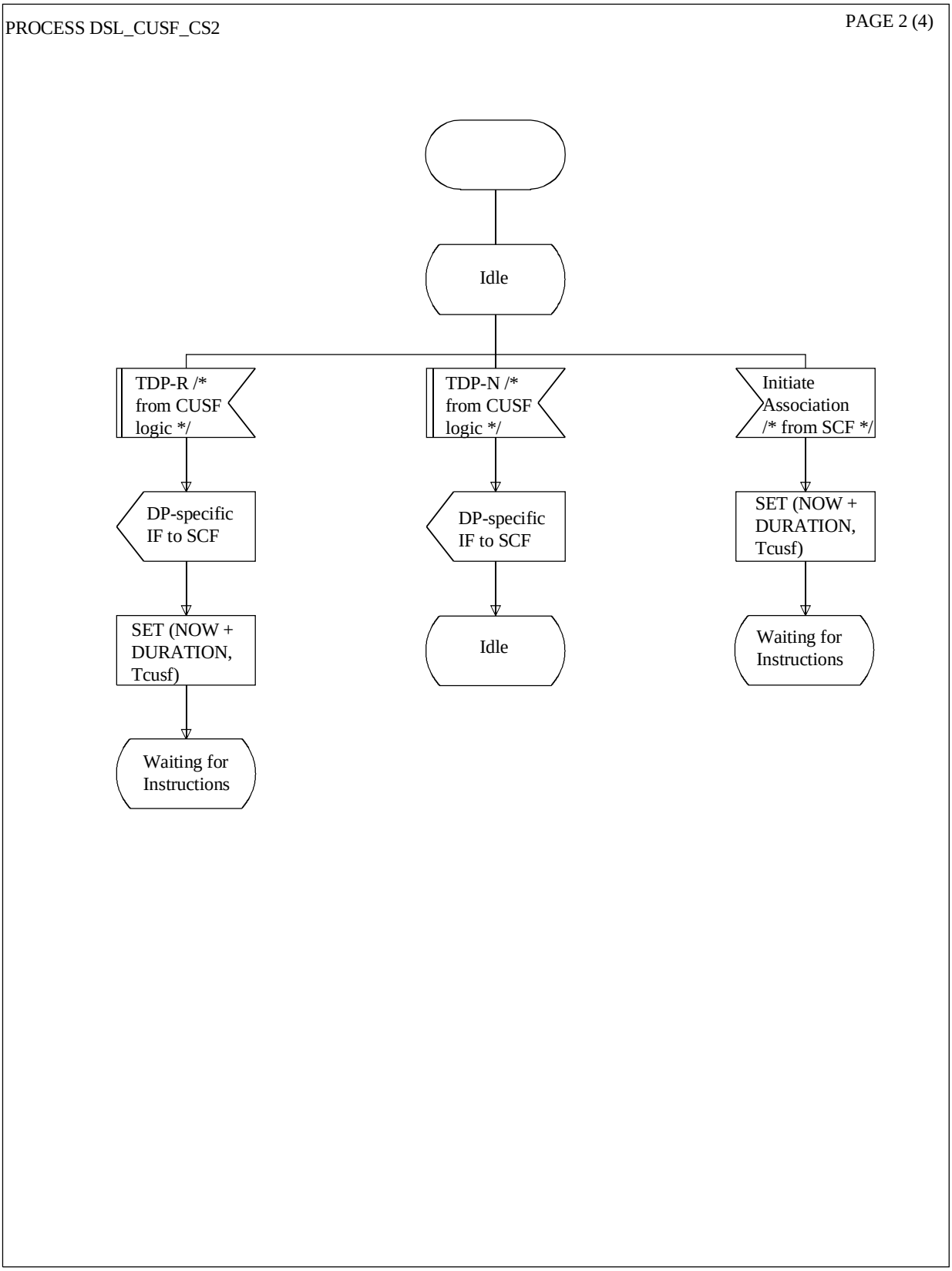

Figure 11-117/Q.1224 (sheet 2 of 4) – Distributed service logic for CUSF FE

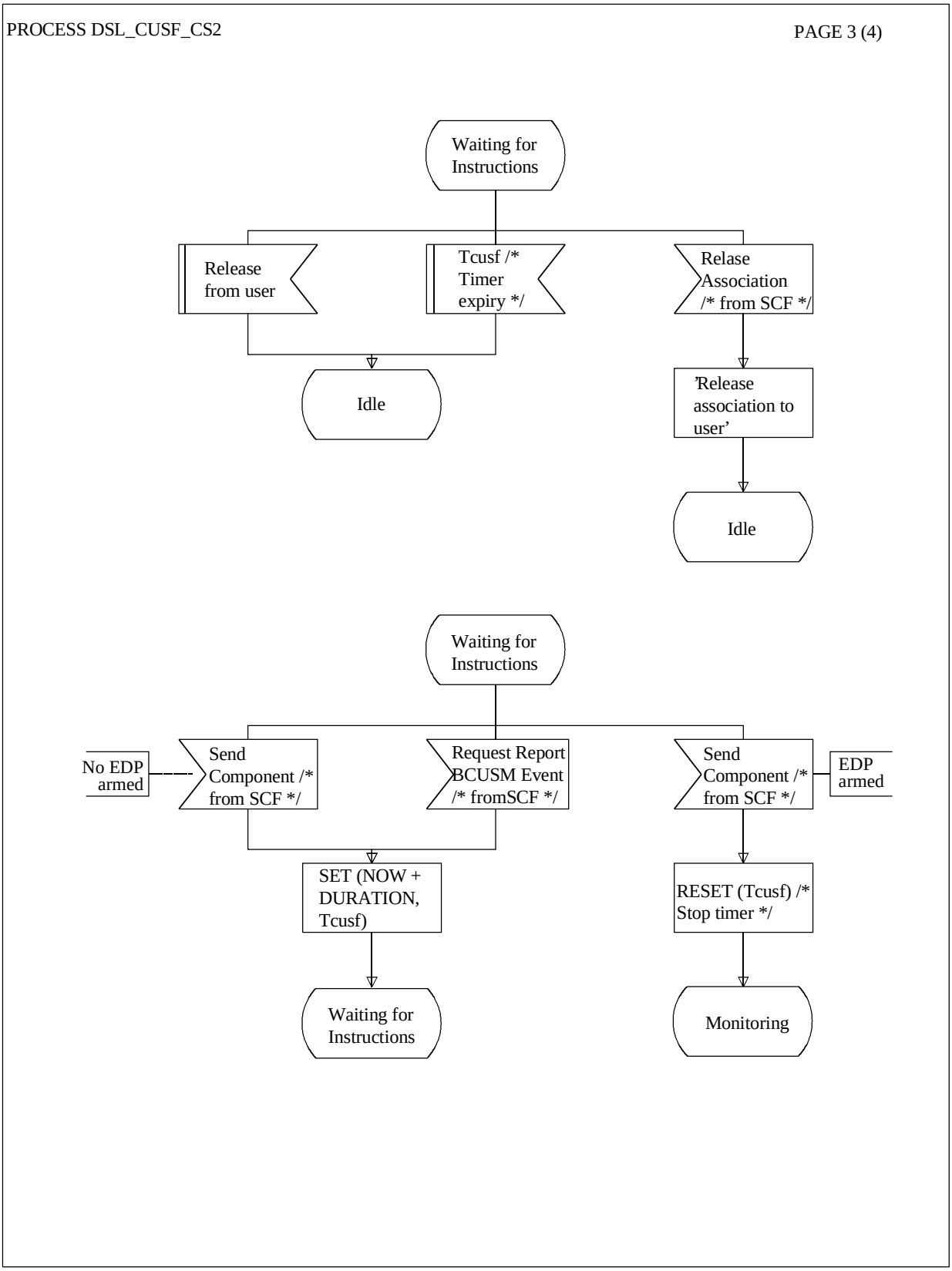

Figure 11-117/Q.1224 (sheet 3 of 4) – Distributed service logic for CUSF FE

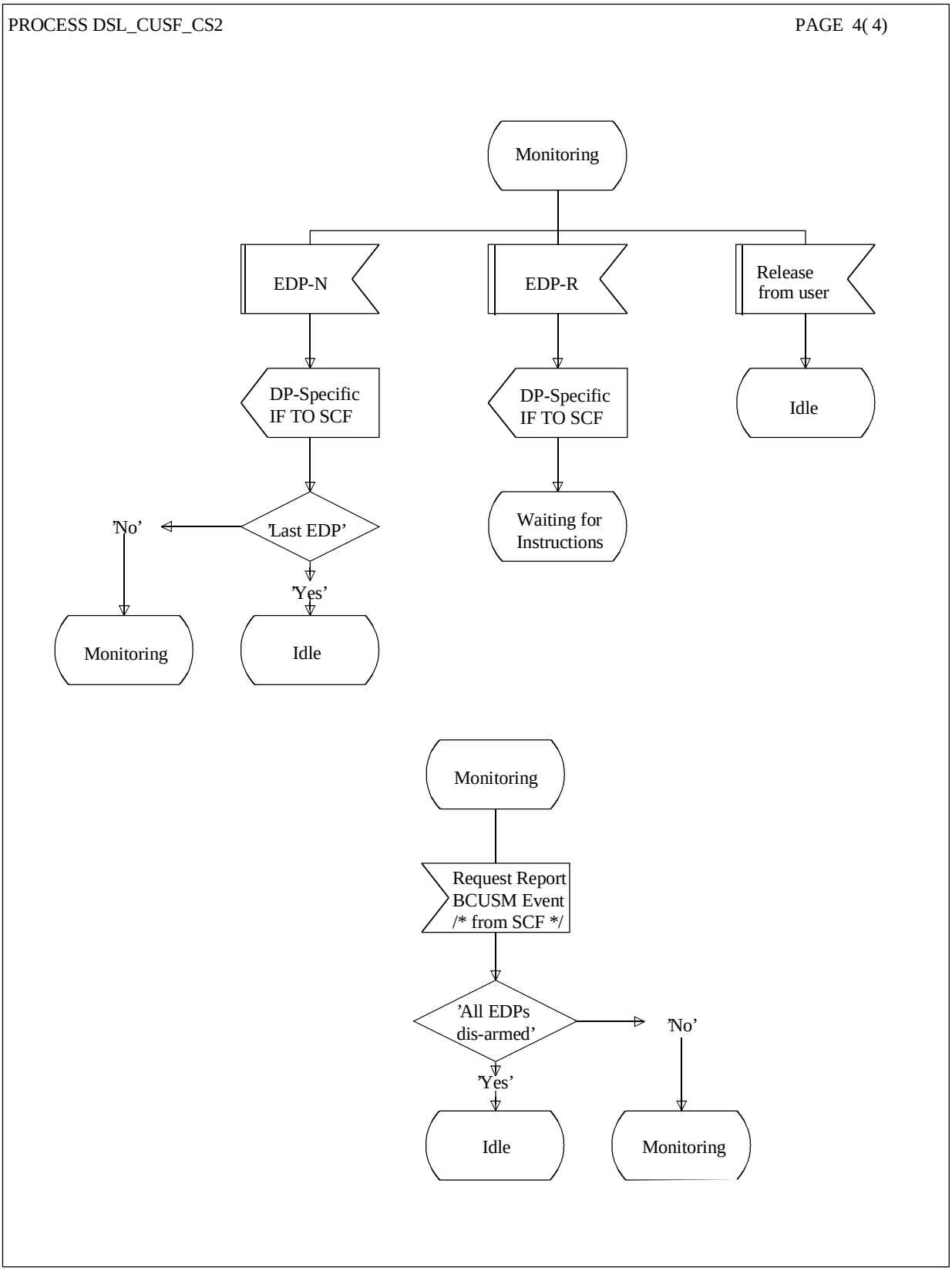

Figure 11-117/Q.1224 (sheet 4 of 4) – Distributed service logic for CUSF FE

11.6 Mapping between information flows and SIBs

Table 11-3 summarises the mapping of Information Flows to the SIB stage 2 descriptions. Only Information Flows actually used by the SIBs are shown.

Table 11-3/Q.1224 – Relationship of Information Flows to SIBs

IF reference	Information Flow	SIB name
12.4.3	**Information flows between SCF and SSF**	
12.4.3.1	Activate Service Filtering	SERVICE FILTERING
12.4.3.4	Activity Test	Distributed Functionality
12.4.3.5	Activity Test Response	Distributed Functionality
12.4.3.6	Analyse Information	BASIC CALL PROCESS
12.4.3.7	Analysed Information	BASIC CALL PROCESS
12.4.3.8	Apply Charging	CHARGE
12.4.3.9	Apply Charging Report	CHARGE
12.4.3.10	Assist Request Instructions	USER INTERACTION
12.4.3.11	Authorise Termination	BASIC CALL PROCESS
12.4.3.12	Call Gap	Distributed functionality
12.4.3.13	Call Information Report	LOG CALL INFORMATION
12.4.3.14	Call Information Request	LOG CALL INFORMATION
12.4.3.15	Cancel All Requests	BASIC CALL PROCESS
12.4.3.16	Cancel Status Report Request	STATUS NOTIFICATION
12.4.3.17	Collect Information	BASIC CALL PROCESS
12.4.3.18	Collected Information	BASIC CALL PROCESS
12.4.3.19	Connect	BASIC CALL PROCESS, USER INTERACTION
12.4.3.20	Connect to Resource	USER INTERACTION
12.4.3.21	Continue	BASIC CALL PROCESS
12.4.3.22	Create Call Segment Association	BASIC CALL PROCESS
12.4.3.26	Disconnect Forward Connection	USER INTERACTION
12.4.3.27	Disconnect Leg	BASIC CALL PROCESS
12.4.3.28	Entity Released	BASIC CALL PROCESS
12.4.3.29	Establish Temporary Connection	USER INTERACTION
12.4.3.30	Event Notification Charging	CHARGE
12.4.3.33	Facility Selected And Available	BASIC CALL PROCESS
12.4.3.34	Furnish Charging Information	CHARGE
12.4.3.35	Hold Call In Network	QUEUE
12.4.3.36	Initial DP	BASIC CALL PROCESS
12.4.3.37	Initiate Call Attempt	BASIC CALL PROCESS
12.4.3.38	Merge Call Segments	BASIC CALL PROCESS, JOIN

Table 11-3/Q.1224 – Relationship of Information Flows to SIBs *(continued)*

IF reference	Information Flow	SIB name
12.4.3.39	Move Call Segments	BASIC CALL PROCESS, JOIN
12.4.3.40	Move Leg	BASIC CALL PROCESS, JOIN
12.4.3.41	O_Abandon	BASIC CALL PROCESS
12.4.3.42	O_Answer	BASIC CALL PROCESS
12.4.3.43	O_Called Party Busy	BASIC CALL PROCESS
12.4.3.44	O_Disconnect	BASIC CALL PROCESS
12.4.3.45	O_MidCall	BASIC CALL PROCESS
12.4.3.46	O_No_Answer	BASIC CALL PROCESS
12.4.3.47	O_Suspended	BASIC CALL PROCESS
12.4.3.48	Origination Attempt	BASIC CALL PROCESS
12.4.3.49	Origination Attempt Authorized	BASIC CALL PROCESS
12.4.3.50	Reconnect	BASIC CALL PROCESS
12.4.3.51	Release Call	BASIC CALL PROCESS
12.4.3.53	Request Notification Charging Event	CHARGE
12.4.3.54	Request Report BCSM Event	BASIC CALL PROCESS
12.4.3.57	Request Status Report	STATUS NOTIFICATION
12.4.3.58	Reset Timer	BASIC CALL PROCESS
12.4.3.59	Route Select Failure	BASIC CALL PROCESS
12.4.3.60	Select Facility	BASIC CALL PROCESS
12.4.3.61	Select Route	BASIC CALL PROCESS, USER INTERACTION
12.4.3.62	Send Charging Information	CHARGE
12.4.3.65	Service Filtering Response	SERVICE FILTERING
12.4.3.66	Split Leg	BASIC CALL PROCESS, SPLIT
12.4.3.67	Status Report	STATUS NOTIFICATION
12.4.3.68	T_Answer	BASIC CALL PROCESS
12.4.3.69	T_Busy	BASIC CALL PROCESS
12.4.3.70	T_Disconnect	BASIC CALL PROCESS
12.4.3.71	T_MidCall	BASIC CALL PROCESS
12.4.3.72	T_No_Answer	BASIC CALL PROCESS
12.4.3.73	T_Suspended	BASIC CALL PROCESS
12.4.3.74	Termination Attempt	BASIC CALL PROCESS
12.4.3.75	Termination Attempt Authorized	BASIC CALL PROCESS
12.5.2	**Information flows between the SCF and SRF**	
12.5.2.1	Assist Request Instructions From SRF	USER INTERACTION
12.5.2.2	Cancel Announcement	USER INTERACTION
12.5.2.3	Collected User Information	USER INTERACTION

Table 11-3/Q.1224 – Relationship of Information Flows to SIBs *(continued)*

IF reference	Information Flow	SIB name
12.5.2.5	Play Announcement	USER INTERACTION
12.5.2.6	Prompt And Collect User Information	USER INTERACTION
12.5.2.8	Script Close	USER INTERACTION
12.5.2.9	Script Event	USER INTERACTION
12.5.2.10	Script Information	USER INTERACTION
12.5.2.11	Script Run	USER INTERACTION
12.5.2.12	Specialized Resource Report	USER INTERACTION
12.6.2	**Information flows between the SCF and SCF**	
12.6.2.3	Additional Information Result	MESSAGE HANDLER
12.6.2.4	Confirmed Notification Provided	MESSAGE HANDLER
12.6.2.5	Confirmed Report Charging Information	MESSAGE HANDLER
12.6.2.6	Establish Charging Record	MESSAGE HANDLER
12.6.2.7	Handling Information Referral	INITIATE SERVICE PROCESS, MESSAGE HANDLER
12.6.2.8	Handling Information Request	INITIATE SERVICE PROCESS, MESSAGE HANDLER
12.6.2.9	Handling Information Result	MESSAGE HANDLER
12.6.2.10	Network Capability Request	MESSAGE HANDLER
12.6.2.11	Network Capability Result	MESSAGE HANDLER
12.6.2.12	Notification Provided	MESSAGE HANDLER
12.6.2.13	Notification Provided Confirmation	MESSAGE HANDLER
12.6.2.14	Provide User Information	MESSAGE HANDLER
12.6.2.15	Report Charging Information	MESSAGE HANDLER
12.6.2.16	Report Charging Information Confirmation	MESSAGE HANDLER
12.6.2.17	Request Notification	MESSAGE HANDLER
12.6.2.18	SCF Bind Request	INITIATE SERVICE PROCESS
12.6.2.19	SCF Bind Result	INITIATE SERVICE PROCESS
12.6.2.20	SCF Unbind Request	END
12.7.2	**Information flows between the SCF and CUSF**	
12.7.2.1	Activation Received and Authorized	BASIC CALL UNRELATED PART
12.7.2.4	Association Release Requested	BASIC CALL UNRELATED PART
12.7.2.5	Component Received	BASIC CALL UNRELATED PART, USER INTERACTION
12.7.2.6	Initiate Association	BASIC CALL UNRELATED PART
12.7.2.7	Request Report BCUSM Event	USER INTERACTION
12.7.2.8	Release Association	BASIC CALL UNRELATED PART
12.7.2.9	Send Component	USER INTERACTION

Table 11-3/Q.1224 – Relationship of Information Flows to SIBs *(concluded)*

IF reference	Information Flow	SIB name
12.8.2	**Information flows between the SCF and SDF**	
12.8.2.1	Add Entry	SERVICE DATA MANAGEMENT
12.8.2.2	Add Entry Referral	SERVICE DATA MANAGEMENT
12.8.2.3	Add Entry Result	SERVICE DATA MANAGEMENT
12.8.2.4	Authenticate	AUTHENTICATE
12.8.2.5	Authenticate Result	AUTHENTICATE
12.8.2.6	End Authenticated Relationship	AUTHENTICATE
12.8.2.7	Execute	SERVICE DATA MANAGEMENT, TRANSLATE
12.8.2.8	Execute Referral	SERVICE DATA MANAGEMENT, TRANSLATE
12.8.2.9	Execute Result	SERVICE DATA MANAGEMENT, TRANSLATE
12.8.2.10	Modify Entry	LOG CALL INFORMATION, SERVICE DATA MANAGEMENT
12.8.2.11	Modify Entry Referral	LOG CALL INFORMATION, SERVICE DATA MANAGEMENT
12.8.2.12	Modify Entry Result	LOG CALL INFORMATION, SERVICE DATA MANAGEMENT
12.8.2.13	Remove Entry	SERVICE DATA MANAGEMENT
12.8.2.14	Remove Entry Referral	SERVICE DATA MANAGEMENT
12.8.2.15	Remove Entry Result	SERVICE DATA MANAGEMENT
12.8.2.16	Search	SCREEN, SERVICE DATA MANAGEMENT, TRANSLATE
12.8.2.17	Search Referral	SCREEN, SERVICE DATA MANAGEMENT, TRANSLATE
12.8.2.18	Search Result	SCREEN, SERVICE DATA MANAGEMENT, TRANSLATE
12.9.2	**Information flows between the SDF and SDF**	
12.9.2.1	Authenticate	AUTHENTICATE
12.9.2.2	Authenticate Result	AUTHENTICATE
12.9.2.3	Chaining Request	LOG CALL INFORMATION, SCREEN, SERVICE DATA MANAGEMENT, TRANSLATE
12.9.2.4	Chaining Result	LOG CALL INFORMATION, SCREEN, SERVICE DATA MANAGEMENT, TRANSLATE
12.9.2.7	End Authenticated Relationship	AUTHENTICATE

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