INTERNATIONAL TELECOMMUNICATION UNION

ITU-T Q.86.4

(06/97)

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

SERIES Q: SWITCHING AND SIGNALLING

Functions and information flows for services in the ISDN – Supplementary services

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Stage 2 description for charging supplementary services: International Freephone Service (IFS)

ITU-T Recommendation Q.86.4

(Previously CCITT Recommendation)

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ITU-T RECOMMENDATION Q.86.4

STAGE 2 DESCRIPTION FOR CHARGING SUPPLEMENTARY SERVICES: INTERNATIONAL FREEPHONE SERVICE (IFS)

Summary

Consistent with Recommendation E.152, International Freephone Service (IFS) Stage 1, this Recommendation constitutes the Stage 2 description for the service, including the functional architecture, Intelligent Network-based descriptions for normal IFS and optional features, and allocation of functional entities to physical locations. This Recommendation also provides Q.1200-Series references for information flows, SDL diagrams, and functional entity actions.

Source

ITU-T Recommendation Q.86.4 was prepared by ITU-T Study Group 11 (1997-2000) and was approved under the WTSC Resolution No. 1 procedure on the 5th of June 1997.

FOREWORD

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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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As of the date of approval of this Recommendation, the ITU had/had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

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Recommendation Q.86.4

STAGE 2 DESCRIPTION FOR CHARGING SUPPLEMENTARY SERVICES: INTERNATIONAL FREEPHONE SERVICE (IFS)

(Geneva, 1997)

4 International Freephone Service (IFS)

4.1 Scope

This Recommendation defines the stage 2 service description for the call handling aspects of the international freephone service on the international Public Switched Telephone Network (PSTN). It is also applicable to IFS callers located on ISDNs or private networks directing calls towards IFS customers on the PSTN. It may be applicable to some degree to called IFS customers on ISDNs or private networks.

This Recommendation is specified according to the methodology defined in Recommendation Q.65 (1997).

This Recommendation does not formally describe the relationship between this supplementary service and basic call. Where possible, this information is included for guidance.

"The **international freephone service (IFS)** enables a customer in one country to be assigned one or more special telephone numbers in another country(ies) which allow callers in those countries to call the customer free of charge. All service and call-related charges are paid by the customer. " (4.1/E.152.)

This Recommendation is applicable to the stage 3 Recommendation for the IFS service. The term "stage 3" is also defined in Recommendation I.130. Where the text indicates the status of a requirement (i.e. as strict command or prohibition, as authorization leaving freedom, or as a capability or possibility), this shall be reflected in the text of the relevant stage 3 Recommendations.

Conformance to this Recommendation is met by conforming to the stage 3 Recommendations with the field of application appropriate to the equipment being implemented. Therefore no method of testing is provided for this Recommendation.

4.2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

– ITU-T Recommendation E.152 (1996), *International freephone service.*

– ITU-T Recommendation Q.1213 (1995), *Global functional plane for intelligent network CS-1*.

– ITU-T Recommendation Q.1214 (1995), *Distributed functional plane for intelligent network CS-1*.

– ITU-T Recommendation Q.1215 (1995), *Physical plane for intelligent network CS-1*.

– ITU-T Recommendation Q.65 (1997), *The unified functional methodology for the characterization of services and network capabilities.*

4.3 Definitions

This Recommendation defines the following terms.

4.3.1 IFS customer: The individual or entity who (or which) obtains an international freephone service from an IFS service provider, and is responsible for payment of all charges due to that IFS service provider.

4.3.2 IFS caller: The person who places a call to an IFS number.

These definitions are extracted from clause 3/E.152.

4.4 Symbols and abbreviations

This Recommendation uses the following symbols and abbreviations:

CCAF Call Control Agent Function

CCF Call Control Function

CID Call Instance Data

CIDFP Call Instance Data Field Pointer

CLI Calling Line Identity

FE Functional Entity

FIFO First-In-First-Out

IFS International Freephone Service

IN Intelligent Network

ISDN Integrated Services Digital Network

LE Local Exchange

PNX Private Network Exchange

PSTN Public Switched Telephone Network

SCF Service Control Function

SDF Service Data Function

SDL Specification and Description Language

SIB Service Independent Building Block

SRF Specialized Resource Function

SSF Service Switching Function

TE Terminal Equipment

TR Transit Exchange

4.5 Description

Not applicable.

4.6 Derivation of the functional model

International freephone service and its optional customer features are characterized in terms of SIBs in the IN context. The applicable functional model is that of the intelligent network as defined in Recommendation Q.1214, modified to show explicitly that initiating and terminating end treatment are required.

4.6.1 Functional model description

The functional model defining the supplementary service aspects of IFS is shown in Figure 4-1.

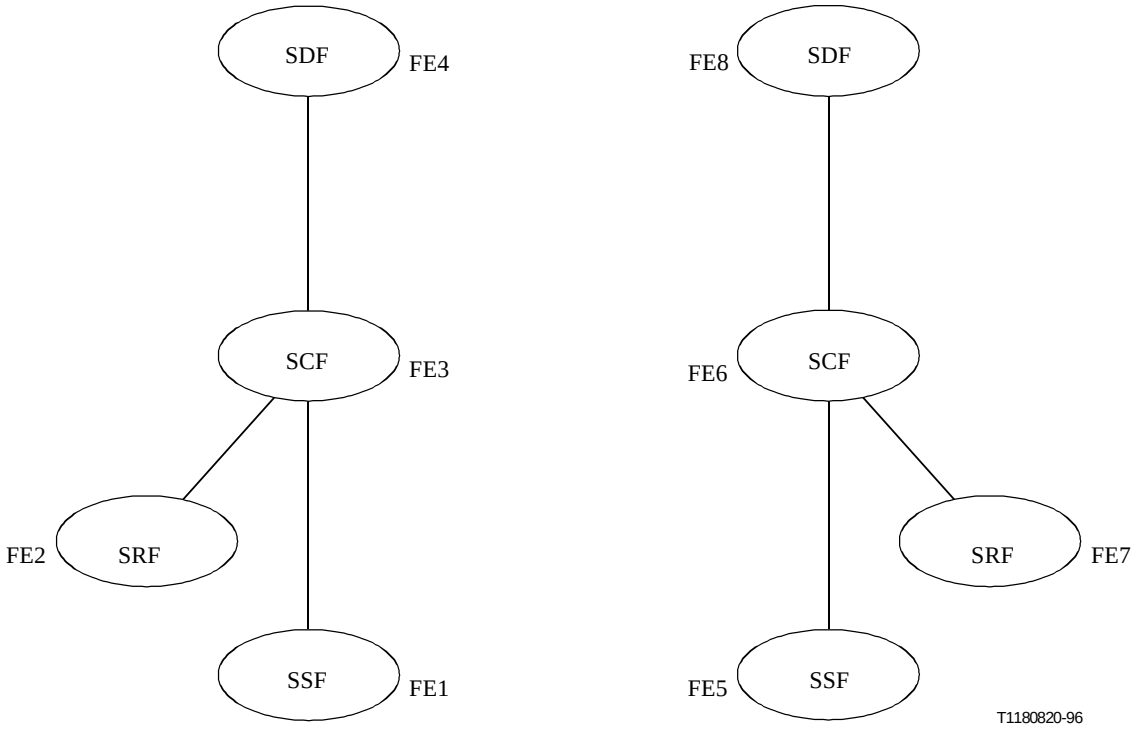


Figure 4-1/Q.86.4 – IFS functional model

4.6.2 Description of functional entities

The Functional Entities (FEs) required by IFS above those of basic call are as follows:

– FE1: Originating service switching function.
– FE2: Originating side specialized resource function.
– FE3: Originating side service control function.
– FE4: Originating side service data function.
– FE5: Terminating side service switching function.
– FE6: Terminating side service control function.
– FE7: Terminating side specialized resource function.
– FE8: Terminating side service data function.

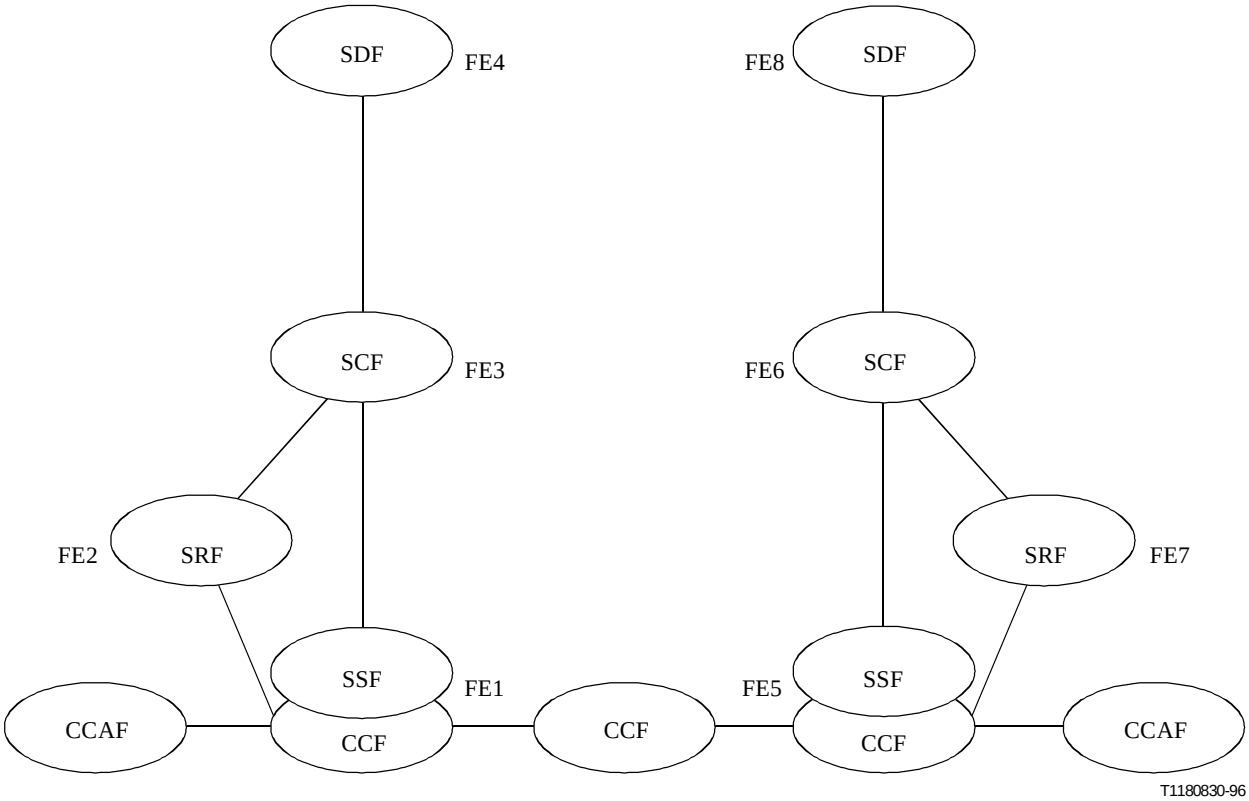
The following table shows the functional entities spanned by each SIB used in this Recommendation, and the subclauses of Recommendation Q.1213 corresponding to the SIBs.

SIB	CCF/SSF	SCF	SDF	SRF	Q.1213 subclause
Translate		X	X		5.14
Log call information	X	X	X		5.9
User interaction	X	X		X	5.15
Screen		X	X		5.11
Compare		X			5.6
Queue	X	X		X	5.10

4.6.3 Relationship with basic service

The relationship of the IFS functional model to basic service is shown in Figure 4-2.

NOTE – The basic call model for this Recommendation is defined in Recommendation Q.1214.



CCF Call Control Function
CCAF Call Control Agent Function

Figure 4-2/Q.86.4 – Relationship of IFS functional model to basic service

4.7 IN SIB-based service feature definitions

These global service logic and SIB diagrams conform to the semantics and syntax of Recommendations Q.1203 and Q.1213 (revised), with the exception that SIB error outputs are not shown or terminated. It is expected that error handling will be implementation-specific and is not covered in this Recommendation.

With no additional customer service features, the SIB-based network support for the IFS service is shown in Figure 4-3.

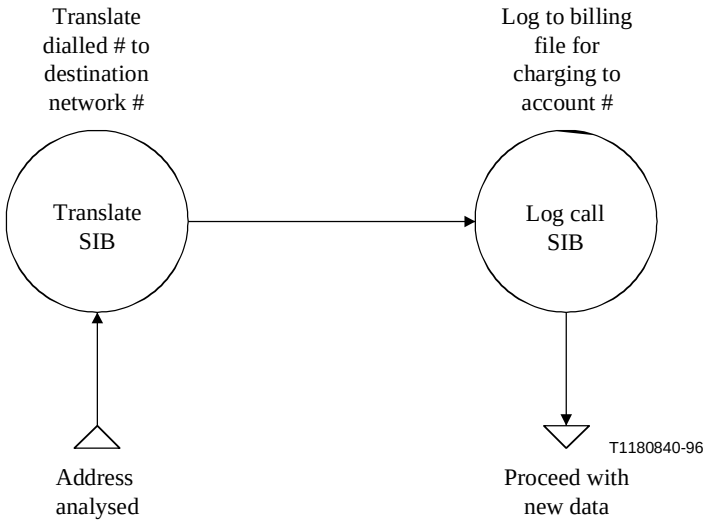


Figure 4-3/Q.86.4 – Normal IFS service

The service support data for this service is shown in the following tables:

Translate SIB	
Service support data	**Values**
Object name	IFS number translation list
Translate filter	Originally dialled IFS number
Translated attribute	Network routing number
CIDFP-info	Originally dialled IFS number
CIDFP-translated	Network routing number

Log call information SIB	
Service support data	**Values**
CIDFP-log	IFS number and call attempt time

NOTE – While this Recommendation does not show all possible combinations of IFS and its options, combinations consistent with the requirements of the stage 1 service description can be readily formulated using IN techniques.

4.7.1 Announcement for caller

See Figure 4.4.

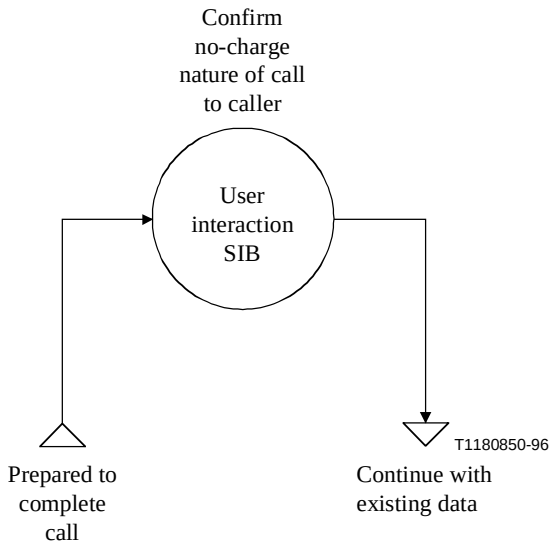


Figure 4-4/Q.86.4 – No-charge announcement to caller

The service support data for this service feature is shown in the following table:

User interaction SIB	
Service support data	**Values**
Announcement ID	Pointer to "confirmation of no-charge" message
Repetition requested	No
Collect information/type	Null (i.e. no collection of user input)
CIDFP-call_party	Caller

This terminating call treatment is in addition to the translation/logging for billing purposes at the initiating end for normal IFS.

This feature can also be provided by the originating network by incorporating the user interaction SIB into normal IFS service (see 4.7, Figure 4-3), as shown in Figure 4-5.

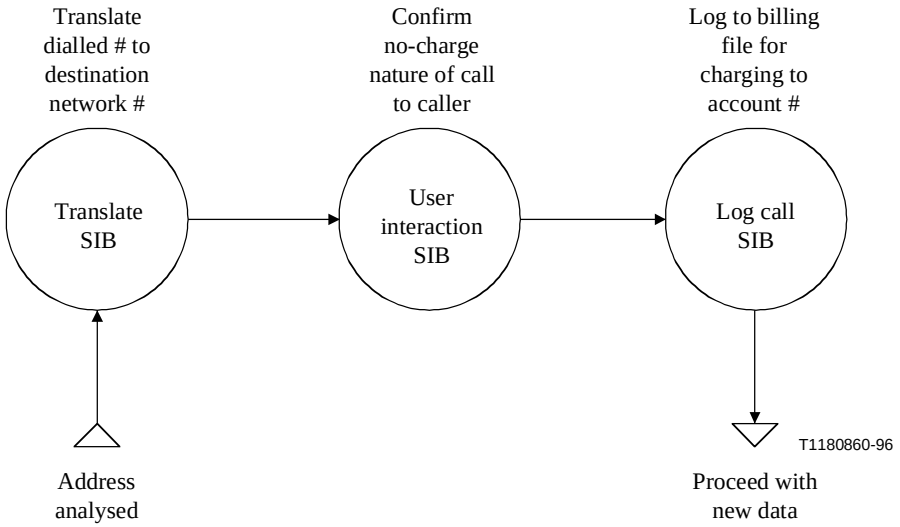


Figure 4-5/Q.86.4 – IFS with originating no-charge announcement

4.7.2 Geographical zone call routing

See Figure 4-6.

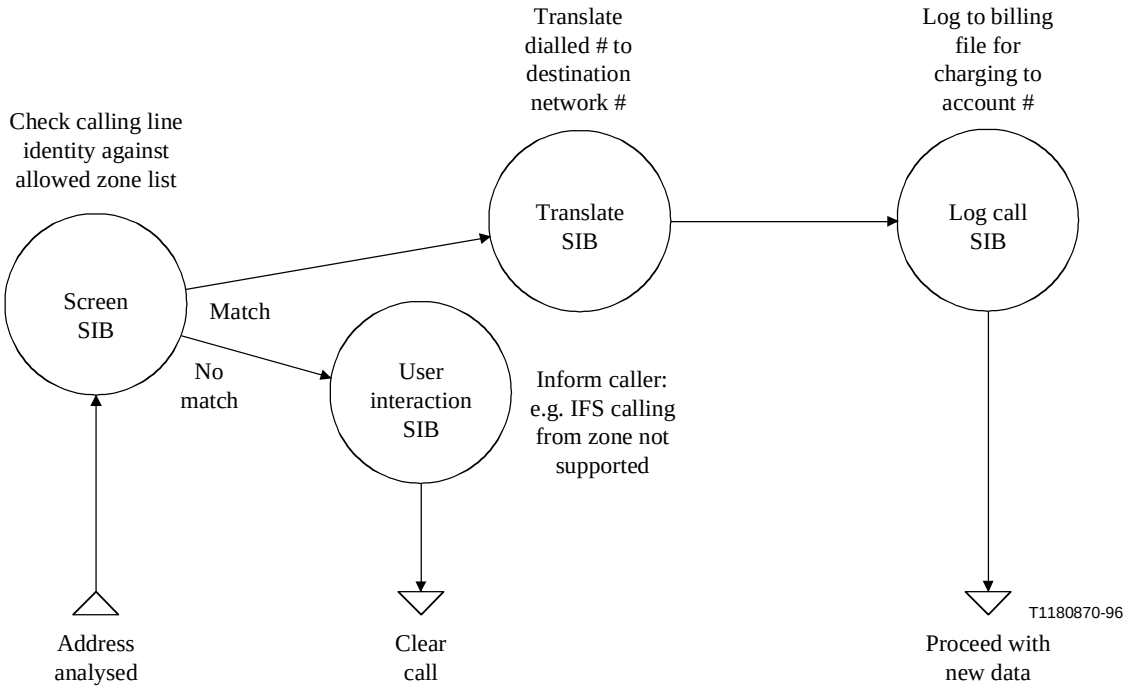


Figure 4-6/Q.86.4 – Geographical zone call routing

The service support data for this service feature is shown in the following tables:

Screen SIB	
Service support data	**Values**
Screen list name	Acceptable zone CLI list
Screen list filter	Calling line identity
CIDFP-screen	Calling line identity

User Interaction SIB	
Service support data	**Values**
Announcement ID	Pointer to "call not allowed from your zone" message
Repetition requested	No
Collect information/type	Null (i.e. no collection of user input)
CIDFP-call_party	Caller

The service support data for the translate and log SIBs is the same as in 4.6.

4.7.3 Variable call routing

Variable call routing consists of a number of service features:

4.7.3.1 Point of origin call routing

See Figure 4-7.

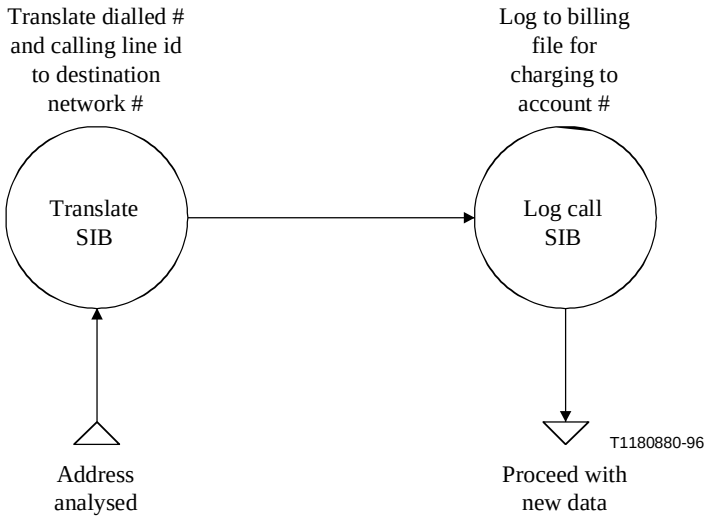


Figure 4-7/Q.86.4 – Point of origin call routing

The service support data for this service feature is shown in the following table:

Translate SIB	
Service support data	**Values**
Object name	IFS point of origin number translation list
Translate filter	Originally dialled IFS number and CLI
Translated attribute	Network routing number
CIDFP-info	Originally dialled IFS number, CLI
CIDFP-translated	Network routing number

The service support data for the log SIB is the same as in 4.6.

This feature can also be provided by the terminating network (in addition to normal originating treatment) as shown in Figure 4-8.

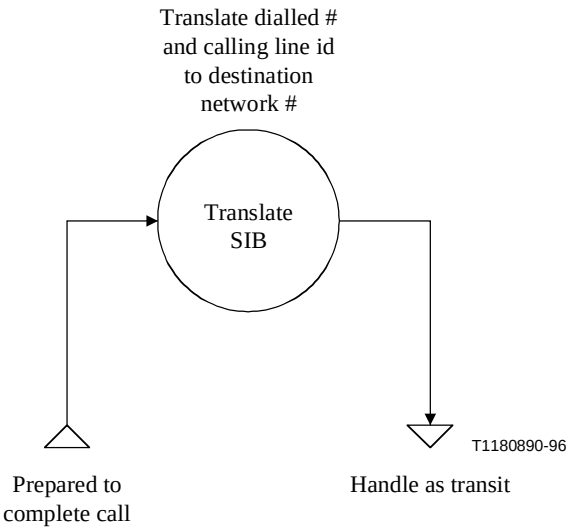


Figure 4-8/Q.86.4 – Point of origin call routing (destination)

4.7.3.2 Time-dependent call routing

4.7.3.2.1 Time-dependent routing to alternative destinations

This feature is illustrated by an example using a different translation during the lunch period (1200 to 1400 hours). The parameters and the structure may vary from IFS customer-to-IFS customer. See Figure 4-9.

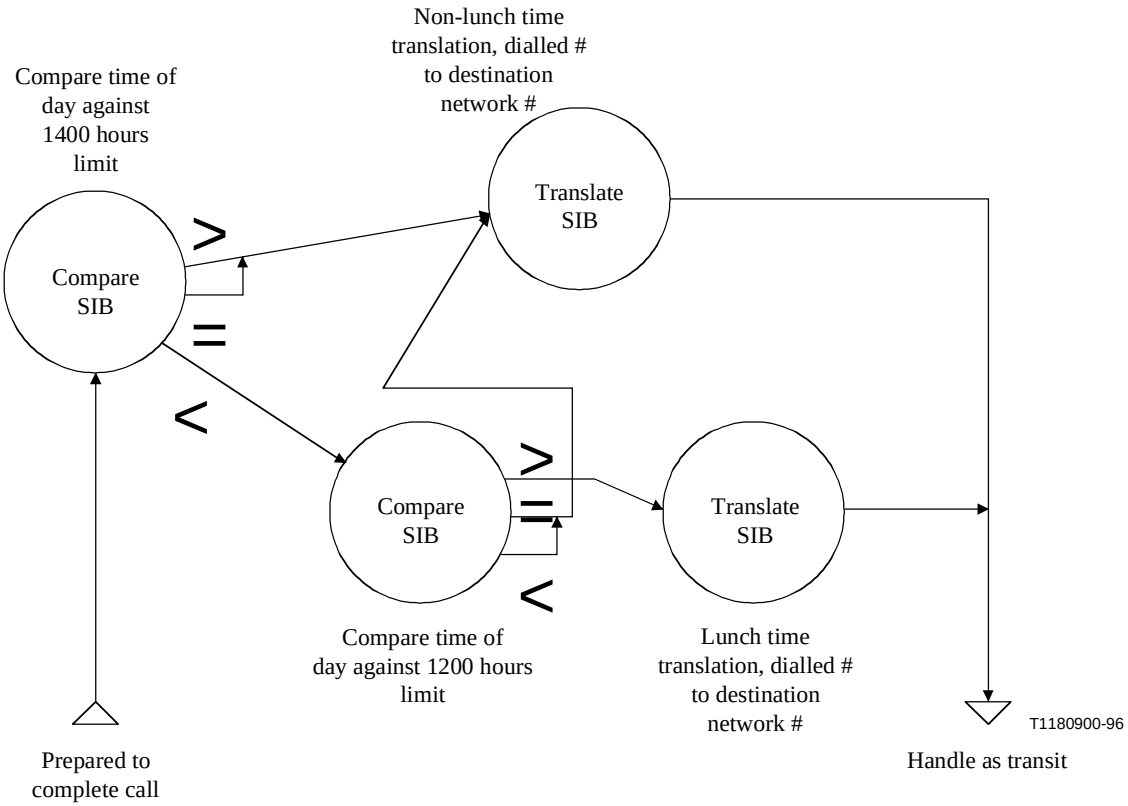


Figure 4-9/Q.86.4 – Time-dependent call routing

The service support data for this service feature is shown in the following tables:

Compare SIB	
Service support data	**Values**
Comparison type	Time, day or date, per customer requirements
CIDFP-compare	Time, day or date, per customer requirements
Reference value	Value of time, day or date, per customer requirements

Translate SIB	
Service support data	**Values**
Object name	Customer-specific IFS translation list corresponding to service logic leg
Translate filter	Originally dialled IFS number
Translated attribute	Network routing number
CIDFP-info	Originally dialled IFS number, CLI
CIDFP-translated	Network routing number

This terminating call treatment is in addition to the translation/logging for billing purposes at the initiating end for normal IFS.

4.7.3.2.2 Time-dependent routing to alternative destinations or announcement

As a second example, the call can be routed to a destination or an announcement. See Figure 4-10.

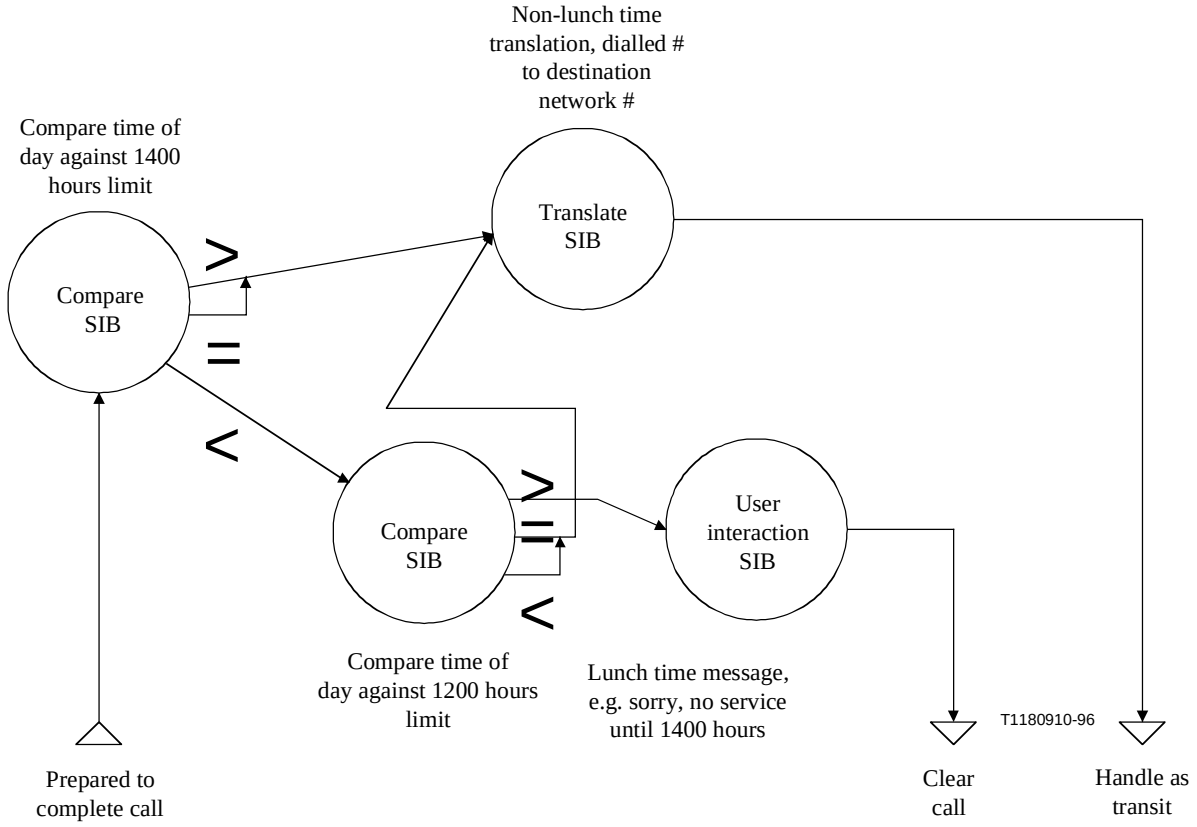


Figure 4-10/Q.86.4 – Time-dependent routing to destination or announcement

The additional service support data for this service feature is shown in the following table:

User interaction SIB	
Service support data	**Values**
Announcement ID	Pointer to "no lunch-time service" message
Repetition requested	No
Collect information/type	Null (i.e. no collection of user input)
CIDFP-call_party	Caller

This terminating call treatment is in addition to the translation/logging for billing purposes at the initiating end for normal IFS.

4.7.3.3 Date-dependent call routing

This feature is illustrated by an example using a different translation for Bastille Day, 14 July. The parameters and the structure may vary from IFS customer-to-IFS customer. See Figure 4-11.

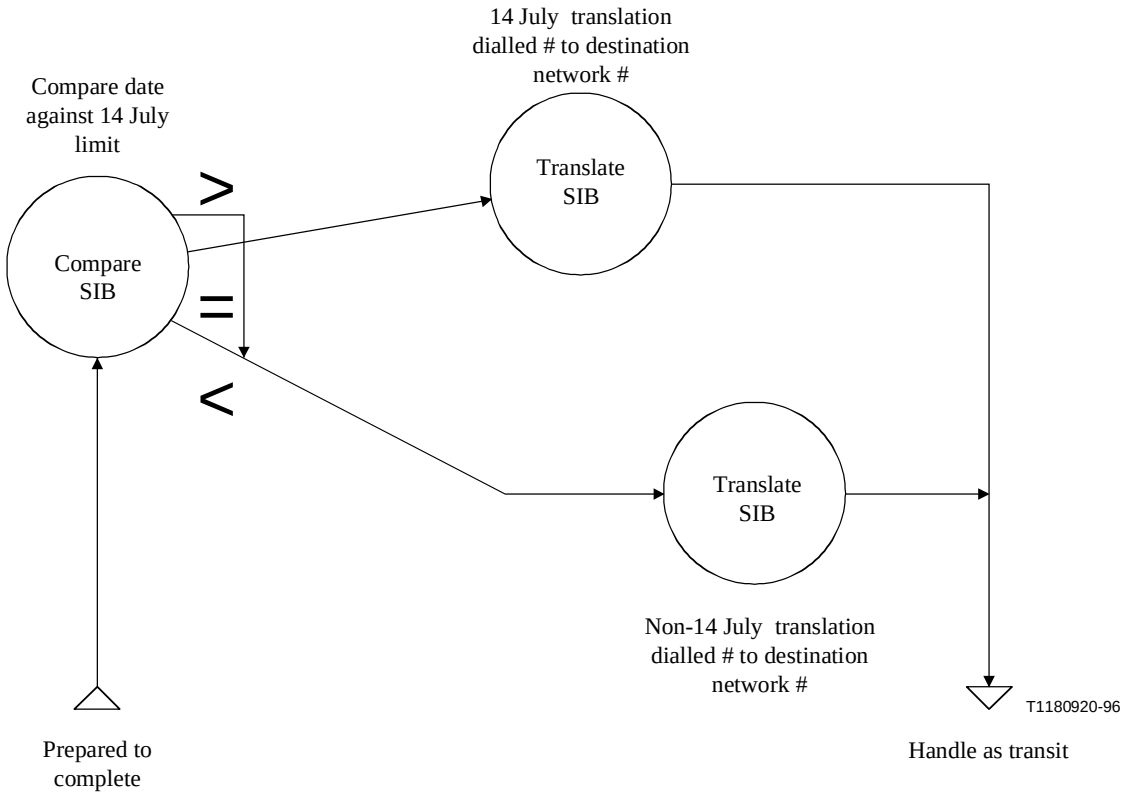


Figure 4-11/Q.86.4 – Date-dependent call routing

The service support data for the translate SIB is the same as in 4.7.3.2. This terminating call treatment is in addition to the translation/logging for billing purposes at the initiating end for normal IFS.

4.7.3.4 Variable (follow-me) call routing

This is a service management feature and not part of call control. As such, it is beyond the scope of the stage 2 Recommendation.

4.7.3.5 Call completion on busy (traffic dependent) call routing

This terminating call treatment consists of the following three sub-options and is in addition to the translation/logging for billing purposes at the initiating end for normal IFS:

– Diversion of calls to alternative destinations.

– Queueing of calls.

– Recorded announcements.

4.7.3.5.1 Diversion of calls to alternative destinations

See Figure 4-12.

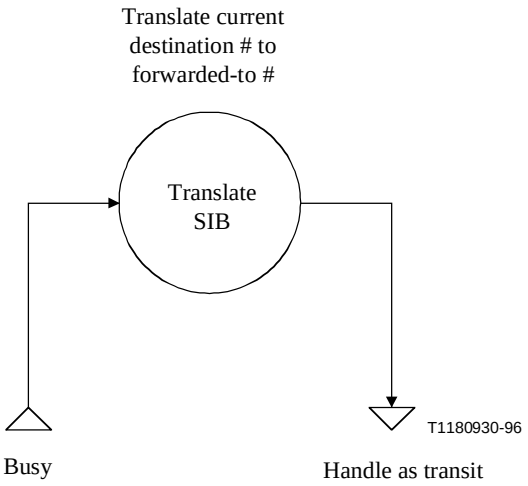


Figure 4-12/Q.86.4 – Diversion on busy

The service support data for this service feature is shown in the following table:

Translate SIB	
Service support data	**Values**
Object name	Forwarding number translation list
Translate filter	Destination number
Translated attribute	Forwarding number
CIDFP-info	Destination number
CIDFP-translated	Forwarding number

4.7.3.5.2 Queueing of calls/recorded announcements

See Figure 4-13.

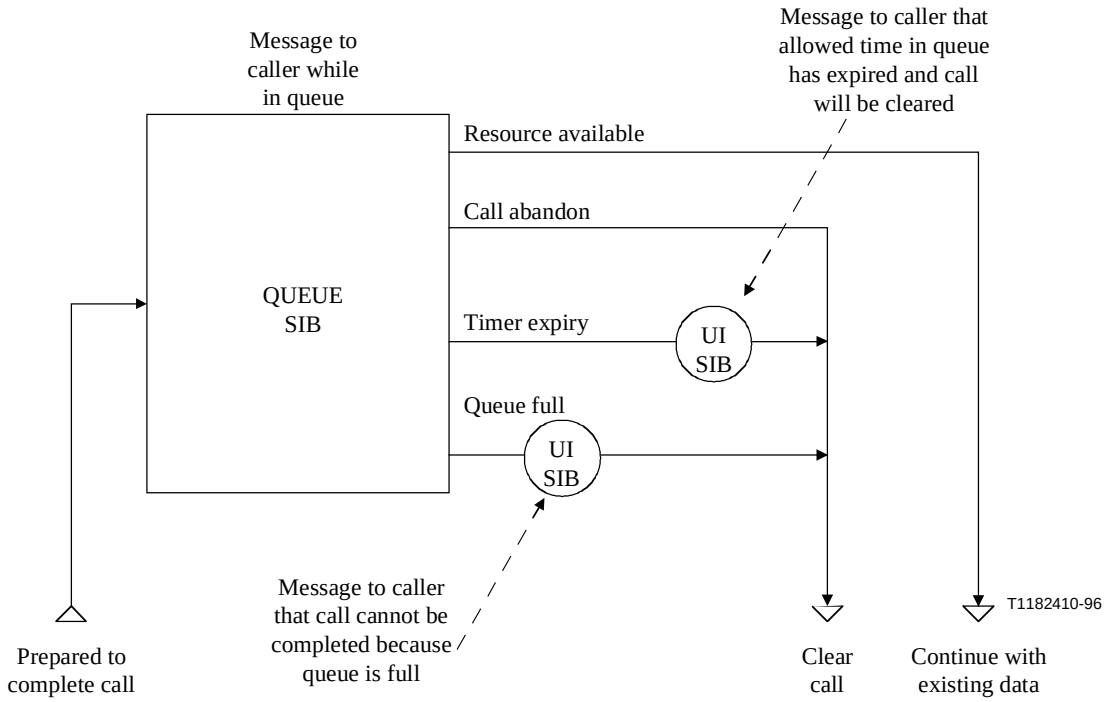


Figure 4-13/Q.86.4 – Queueing of calls/recorded announcements

The service support data for this service feature is shown in the following tables:

Queue SIB	
Service support data	**Values**
Max active	Maximum number of simultaneous calls supported at the IFS subscriber
Max number	Maximum number of calls allowed in the queue
Max time	Maximum time a call is allowed to remain in a queue
Announcement ID	Pointer to "an attendant will be with you shortly" message
Repetition requested	Customer specified
Repetition interval	Customer specified
Maximum repetitions repeated	Customer specified
CIDFP-call_party	Caller

User interaction SIB	
Service support data	**Values**
Announcement ID	Pointer to "queue full" or "timer expiry" message
Repetition requested	No
Collect information/type	Null (i.e. no collection of user input)
CIDFP-call_party	Caller

4.7.4 Additional customer service statistics/real-time information

As a national option, the network should provide by suitable means, to the extent possible, the called and calling number, from which the customer can deduce the origin of the call and the charging related to the call.

4.8 Information flows

International freephone service and its optional customer features are characterized in terms of SIBs. The information flows for these SIBs are defined in Recommendation Q.1214 as shown in the following table.

SIB information flows	Q.1214 subclause
Translate	5.2.11.2
Log call information	5.2.6.2
User interaction	5.2.12.2
Screen	5.2.8.2
Compare	5.2.3.2
Queue	5.2.7.2

NOTE – No new information flows are required between the CCAF ↔ CCF (r_1 and r_3) or CCF ↔ CCF (r_2).

4.9 SDL diagrams for functional entities

International freephone service and its optional customer features are characterized in terms of SIBs. The SDL diagrams for these SIBs are defined in Recommendation Q.1214 as shown in the following table.

SIB SDLs	Q.1214 subclause
Translate	5.2.11.3
Log call information	5.2.6.3
User interaction	5.2.12.3
Screen	5.2.8.3
Compare	5.2.3.3
Queue	5.2.7.3

4.10 Functional entity actions

International freephone service and its optional customer features are characterized in terms of SIBs. The functional entity actions for these SIBs are defined in Recommendation Q.1214 as shown in the following table.

SIB functional entity actions	Q.1214 subclause
Translate	5.2.11.4
Log call information	5.2.6.4
User interaction	5.2.12.4
Screen	5.2.8.4
Compare	5.2.3.4
Queue	5.2.7.4

4.11 Allocation of functional entities to physical locations

International freephone service and its optional customer features are characterized in terms of SIBs and the IN functional model. The allocation options for IN functional entities to IN generic physical entities are defined in Recommendation Q.1215. Such allocation is shown in Figure 1/Q.1215. These options include the collapsing of various combinations of FEs into single PEs, if desired.

The allocation options of SSF FEs to specific network physical entities is shown in the following table:

	FE1	FE5
Scenario 1	Originating LE	Destination LE (Note)
Scenario 2	Originating TR	Destination LE (Note)
Scenario 3	Originating international gateway	Destination LE (Note)
Scenario 4	Originating LE	Destination PNX
Scenario 5	Originating TR	Destination PNX
Scenario 6	Originating international gateway	Destination PNX
NOTE – The called user's TE shall be directly attached to the destination LE in these scenarios.		

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