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SERIES M: TMN AND NETWORK MAINTENANCE: INTERNATIONAL TRANSMISSION SYSTEMS, TELEPHONE CIRCUITS, TELEGRAPHY, FACSIMILE AND LEASED CIRCUITS

Telecommunications management network

TMN service management requirements for information interchange across the TMN X-interface to support provisioning of Emergency Telecommunication Service (ETS)

ITU-T Recommendation M.3350

ITU-T M-SERIES RECOMMENDATIONS

TMN AND NETWORK MAINTENANCE: INTERNATIONAL TRANSMISSION SYSTEMS, TELEPHONE CIRCUITS, TELEGRAPHY, FACSIMILE AND LEASED CIRCUITS

Introduction and general principles of maintenance and maintenance organization	M.10–M.299
International transmission systems	M.300–M.559
International telephone circuits	M.560–M.759
Common channel signalling systems	M.760–M.799
International telegraph systems and phototelegraph transmission	M.800–M.899
International leased group and supergroup links	M.900–M.999
International leased circuits	M.1000–M.1099
Mobile telecommunication systems and services	M.1100–M.1199
International public telephone network	M.1200–M.1299
International data transmission systems	M.1300–M.1399
Designations and information exchange	M.1400–M.1999
International transport network	M.2000–M.2999
Telecommunications management network	**M.3000–M.3599**
Integrated services digital networks	M.3600–M.3999
Common channel signalling systems	M.4000–M.4999

For further details, please refer to the list of ITU-T Recommendations.

ITU-T Recommendation M.3350

TMN service management requirements for information interchange across the TMN X-interface to support provisioning of Emergency Telecommunication Service (ETS)

Summary

This Recommendation provides the basic functional requirements, framework, and use-cases for interchange of service management information across the TMN X-interface between a service customer and service provider, both officially authorized, associated with provision of Emergency Telecommunication Service (ETS). This capability is called the Emergency Telecommunication Service (ETS) Management Service (ETSMS).

Source

ITU-T Recommendation M.3350 was approved on 7 May 2004 by ITU-T Study Group 4 (2001-2004) under the WTSA Resolution 1 procedure.

Keywords

Disaster relief, ETS, requirements, service management, TMN, X-interface.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. 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 Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 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.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure e.g. interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

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As of the date of approval of this Recommendation, ITU 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.

CONTENTS

Introduction

During catastrophic events, such as earthquakes, severe storms, floods, and civil unrest, governmental and other essential users of public telecommunications need a preferential telecommunication capability to support emergency and disaster relief operations. Telecommunication resources are often restricted during these serious events due to damage, congestion, and failures. Therefore, it is desirable to establish and manage telecommunication capabilities to support disaster relief operations that will provide a high probability of completion of emergency telecommunications. ITU-T Rec. E.106 [1] describes an International Emergency Preference Scheme (IEPS) for PSTN, ISDN, and PLMN telephony services to support emergency recovery activities during crises.

Certain international and national telecommunication capabilities will enable authorized users to have preferential access to telecommunication services and preferential processing of telecommunications to support recovery operations during emergency and disaster events. These capabilities, when provided nationally, are referred to as the Emergency Telecommunication Service (ETS). While some countries already have national preference schemes in existing telecommunication systems, the challenge at hand is provisioning appropriate priority mechanisms for a family of multimedia services in the newly emerging generation of packet-based networks, as well as ensuring effective interoperation with existing PSTN, ISDN, and PLMN emergency services, facilitating also international telecommunications when applying ITU-T Rec. E.106. Interchange of critical service management information could significantly benefit emergency recovery operations. Service management information associated with ETS operations needs to be shared between SP and SC authorized to manage emergency and disaster relief operations to ensure the best possible telecommunication support is provided under the stressful circumstances. The ETS Management Service (ETSMS) addressed by this Recommendation will provide this capability.

ITU-T Recommendation M.3350

TMN service management requirements for information interchange across the TMN X-interface to support provisioning of Emergency Telecommunication Service* (ETS)

1 Scope

The subject of this Recommendation is the interface between a duly authorized service customer (SC) and a duly authorized service provider (SP) that is used to manage emergency telecommunication service (ETS) features. ETS features are used by emergency responders during disaster events for telecommunications to organize and coordinate activities for saving lives and restoring community infrastructure. The definition of actual ETS features and requirements are the subject of other Recommendations.

This Recommendation describes the ETS Management Service (ETSMS) and identifies functional requirements for interchange of critical service management information, which relates to ETS features, among TMNs across the X-interface of the service management layer as defined by ITU-T Rec. M.3010 [2]. The requirements described will enable authorized disaster response and recovery operations personnel, as SCs, to interact with SPs to share knowledge of the availability of services, configure services, and activate required services. Some aspects of the ETSMS may be used at any time independent of the occurrence of actual emergencies.

Other TMN Recommendations will cover the specific format and data elements as well as the protocols for interchange of management information across the X-interface for the ETSMS.

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; 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. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[1] ITU-T Recommendation E.106 (2003), *International Emergency Preference Scheme (IEPS) for disaster relief operations*.

[2] ITU-T Recommendation M.3010 (2000), *Principles for a telecommunication management network*.

[3] ITU-T Recommendation M.3208.1 (1997), *TMN management services for dedicated and reconfigurable circuits network: Leased circuit services*.

[4] ITU-T Recommendation X.731 (1992) | ISO/IEC 10164-2:1993, *Information technology – Open Systems Interconnection – Systems management: State management function*.

[5] ITU-T Recommendation X.790 (1995), *Trouble management function for ITU-T applications*.

* The use of the term "Service, service" in this Recommendation does not imply any recognized service definition in ITU-T; it covers telecommunication capabilities, applications, requirements, features, resources, etc.

3 Terms and definitions

This Recommendation defines the following terms:

3.1 availability: The measure of ability of the network resources to support ETS or ETSMS features that could be used as activated or to be activated by authorized users supporting emergency and disaster relief operations.

3.2 degradation: A state of the ETS in which the quality of service level falls below a minimum threshold specified in the service level agreement between SC and SP.

3.3 ETS Management Service (ETSMS): A management service that provides capabilities for interchange of critical service management information, which is related to available ETS features, between service customers and service providers responsible for disaster relief operations to recover from catastrophic events.

3.4 failure: Loss of capability to support ETS communications or the ETSMS.

3.5 Service Level Agreement (SLA): A Service Level Agreement (SLA) is a formal negotiated agreement between two parties. It is a contract that exists between the Service Provider (SP) and the Service Customer (SC). It is designed to create a common understanding about service, quality, priorities, responsibilities, etc. SLAs can cover many aspects of the relationship between the SC and the SP, such as performance of services, customer care, billing, service provisioning, etc.

3.6 ETS network operator: An authorized organization that operates a telecommunication network and provides ETS features for ETS service users. An ETS network operator may be a SP and vice versa.

3.7 ETS service customer: A designated manager of the ETS features and the recognized user of the ETSMS. There may be different levels of SCs from national and regional down to the immediate local disaster area. The Service Level Agreement (SLA) for the ETS and ETSMS is between the SC and SP.

3.8 ETS service provider: An authorized service provider of the ETS features and the ETSMS.

3.9 ETS service user: The ETS service user (SU) is authorized by the SC to use the ETS features. The SU is not a user of the ETSMS.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations:

ETS Emergency Telecommunication Service

ETSMS ETS Management Service

IEPS International Emergency Preference Scheme (E.106)

ISDN Integrated Services Digital Network

PLMN Public Land Mobile Network

PSTN Public Switched Telephone Network

SC (Authorized ETS) Service Customer

SLA Service Level Agreement

SP (Authorized ETS) Service Provider

SU (Authorized ETS) Service User

TMN Telecommunication Management Network

5 Conventions

Conventions used in use-case diagrams and the use of UML are imported from ITU-T Rec. M.3020.

6 ETSMS functional requirements

6.1 ETSMS framework

Disaster situations can strike unexpectedly anytime and anywhere. Recovery requires rapid response by local, regional, and national authorities, immediate reaction from utility service providers, and support from medical, recovery, fire, police, and construction resources. Effective communications are essential to facilitate the myriad of activities required for organizing and coordinating lifesaving efforts concurrent with re-establishing control in the disaster area and restoration of the community infrastructure. Effective telecommunication services are imperative to the success of disaster recovery and mitigation operations.

Emergency and disaster relief operations require extensive coordination and cooperation by organizations involved in restoring the infrastructure and for the well being of the society impacted. During these disaster situations, telecommunication services are often severely disrupted through facility damage as well as congestions due to significantly increased telecommunication traffic. Operations centres may be established or activated to coordinate the myriad of activities that are required to recover from the destruction, locate missing people, save lives, recover the infrastructure of the community, and restore normal living conditions for the population. ETS telecommunications to support these emergency recovery operations are given preferential access and processing treatment (e.g., as specified in ITU-T Rec. E.106).

The ETS Management Service (ETSMS) provides online interchange of critical telecommunications management information, which is associated in real time with provision of ETS features, and will significantly facilitate and benefit recovery operations. These interactions will more efficiently and effectively facilitate provisioning of essential telecommunications support by the authorized ETS Service Provider (SP), use of ETSMS by the authorized ETS Service Customer (SC), and use of ETS by the ETS Service User (SU). Specific requirements for interchange of important service management information for emergency and disaster relief operations are described in this Recommendation.

Figure 6-1 shows the reference interface X being addressed by this Recommendation. The X-interface is also referred to as the "Service Customer – Service Provider" interface and is used to convey information related to service management as defined in ITU-T Rec. M.3010. Within this Recommendation, the SC is the disaster response individual or function, such as an emergency operations centre, that is assigned responsibility to interface with the ETS management system. ETSMS enables interchange of service management information between SCs and SPs to assist disaster relief operations. The SP provides the ETSMS capability in support of the provisioning of ETS. The network management system and underlying element managers are components of the SP's operations support system. The ETS management system collects data from network and element managers and then makes available agreed upon service management data and information associated with the provision of ETS to the SC.

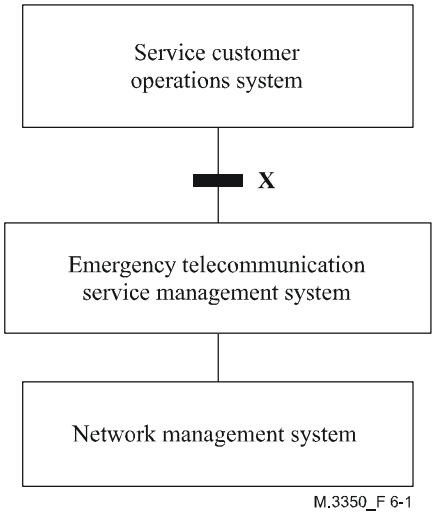

Figure 6-1/M.3350 – Reference interface

The authorized SP/SC/SU relationships for the ETS and ETSMS are illustrated by Figure 6-2. The SP provides ETSMS to support real-time, online interactions between the SC and SP to facilitate use of ETS for emergency operations.

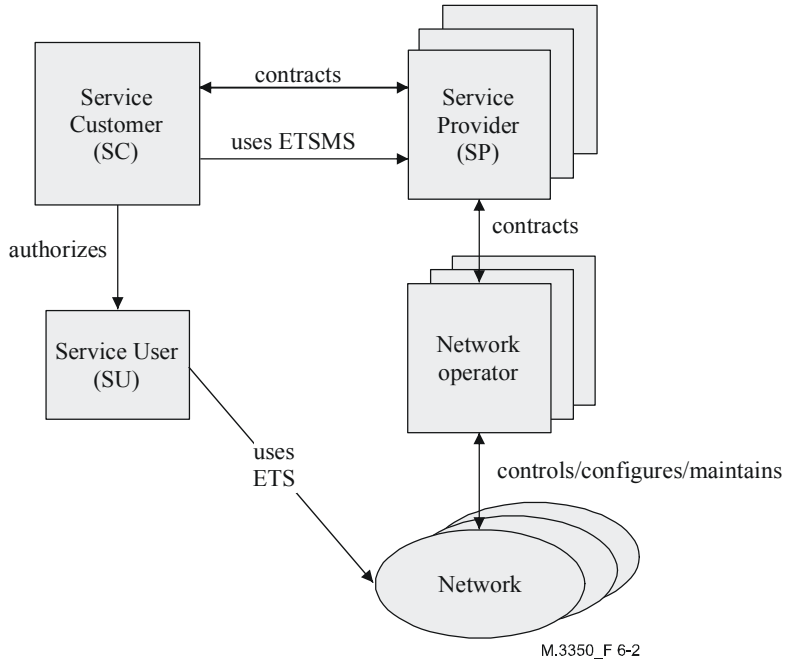

Figure 6-2/M.3350 – SP/SC/SU Roles for ETS and ETSMS

The SC is the party authorized to interface and interact with the ETSMS according to the established Service Level Agreement (SLA), contract, or service subscription established between the SC and SP. The SC then becomes the user of the ETSMS. The SC also identifies authorized SUs in cooperation with the appropriate authority. The authorized SUs will be registered with the SP using the ETSMS. The authorized SUs become the actual users of the ETS features. The SP may contract with a network operator, or the network operator functions may be provided as part of the SP's infrastructure. The network operator function is responsible for controlling, configuring, and maintaining the network infrastructure and resources.

The basic architecture of ETSMS across the X-interface is presented in Figure 6-3. It is adapted from the basic TMN architecture described in ITU-T Rec. M.3010.

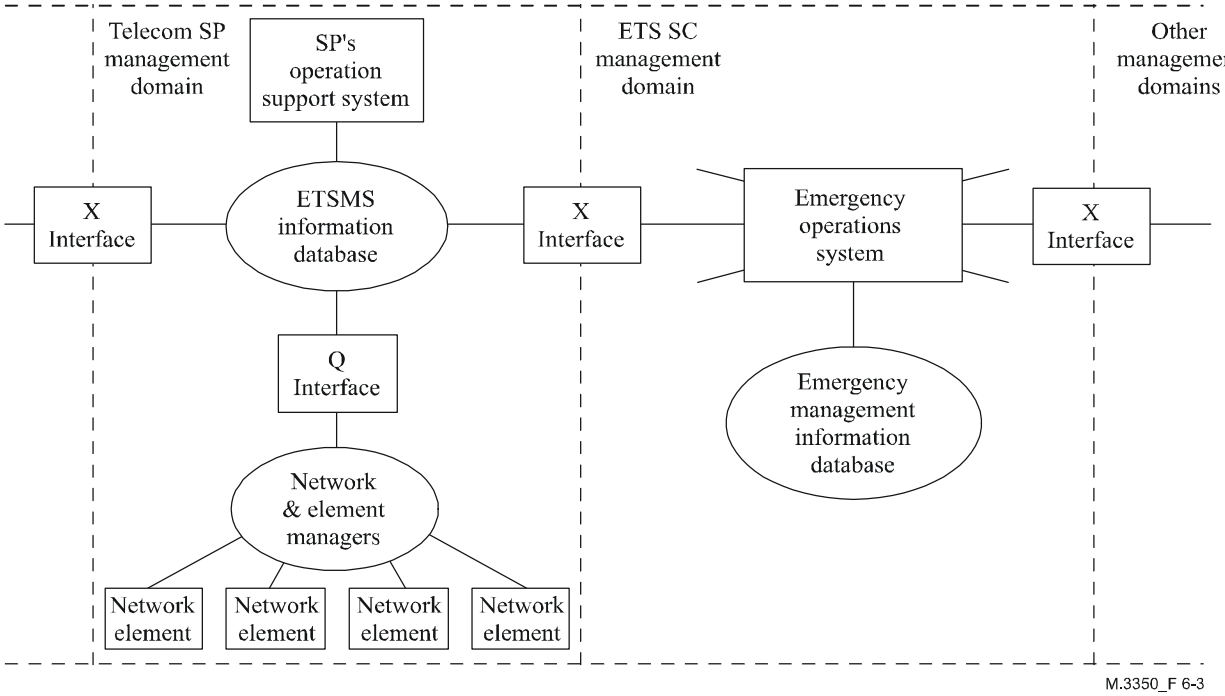

Figure 6-3/M.3350 – Architecture of ETSMS across the X-interface

Each of the management domains shown is considered to be an individual Telecommunication Management Network (TMN). The other management domains could be additional SPs that are supporting the ETS features and SCs that are authorized users of ETSMS. Each domain maintains its own emergency management or ETSMS database. The interchange of information and interactions between the SC and SP takes place across the X-interface. Only specific information that has been agreed upon between the SC and SP is shared using the ETSMS.

6.2 Basic requirements

The ETSMS is a service to support operations of the ETS features by SCs and SPs. It allows SCs to maintain knowledge of ETS availability and to provide reports to SPs of service problems and failures. It also allows SPs to provide SCs with reports of status and availability of ETS features.

Using ETSMS, SCs are able to register new authorized users or change their profiles across the X-interface at any time. If the ETS network features are not always active on a full-time basis, then the SC may use ETSMS to directly make online requests for the SP to activate ETS features as needed for areas that are affected by an emergency.

6.2.1 Management interactions

Table 6-1 lists service management interactions that could be conveyed across the ETSMS interface between SCs and SPs. This is the TMN X-interface for Service Management as defined by ITU-T Rec. M.3010.

Table 6-1/M.3350 – ETS management interactions across ETSMS interface

Initiator	ETS management interactions
Service Customer	Requests for activation of ETS features Modification of ETS parameters Requests for deactivation of ETS features Registration of authorized ETS users Modification of registered ETS user profile Deregistration of authorized ETS users Requests for ETS status Requests for specific on-demand reports about ETS Administration of alert triggers Administration of scheduled reports Submission of ETS trouble reports
Service Provider	ETS usage Reports ETS Security event alerts ETS degradation alerts ETS status change alerts

The ETSMS provides an interactive capability to manage the overall provisioning and maintenance of the ETS during a disaster relief operation. Clauses 6.2.1 and 6.2.2 provide a narrative description of the interactions passed across the interface. Clause 6.3 expands upon the narrative descriptions with specific use-cases that lead to the identification of specific functional requirements to be fulfilled by the ETSMS.

6.2.2 Interactions initiated by service customer

The following provides a narrative description of requests initiated by the SC and sent across the X-interface to the SP for action:

a) Requests for activation of ETS features – The ETS features may be available all the time or only when specifically requested by the SC. If ETS features are only activated upon declaration of an emergency, the SC would issue a request to activate certain ETS features or the total service. The situation may exist that only limited ETS features are always active and additional features are then activated upon request from the SC. Activation requests could include information about types of service to be activated, areas of service coverage, and categories of users to be supported by the ETS for the specific disaster instance.

b) Modification of ETS parameters – It may be necessary to change some parameters of the ETS features being used. For example, the area of coverage, service configuration, or types of service may need to be modified to accommodate specific situations that may arise.

c) Requests for deactivation of ETS features – The ETS features can be deactivated in networks that do not support full time activation of ETS features.

d) Registration of authorized ETS users – Only users specifically authorized by the appropriate authority are allowed to access the ETS features. The SC is responsible for registering the authorized users with the SP so that the SP can authenticate the users of the ETS before the request for access to ETS features is honoured. The registration information would include a profile of the level of service, types of service, and area of coverage that is authorized. In addition to registration of individual authorized users, specific access points and terminals could be registered with the profile of features that are allowed. The registration process may occur at any time, even when ETS is not activated.

e) Modification of registered ETS user profile – The parameters of a registered authorized user's profile can be changed at any time.

f) Deregistration of authorized ETS users – Registered authorized ETS users can be deregistered at any time.

g) Requests for ETS status – At any time, the SC can make a request to the SP to find out if specific ETS features are available. Some features may be active, but are not available because of limited network capacity. Other features may only be activated upon specific request by the SC as indicated in a) above. However, the SC could request the state of availability before an activation request is issued.

h) Requests for specific on-demand reports about ETS – The SC may request specific individual reports or sets of reports at any time. The SC may also terminate the delivery of a report at any time when justified.

i) Administration of alert triggers – Some reports that are to be provided by the SP will only be sent when triggered by specific events. The parameters for the event triggers can be administered through requests provided by the SC.

j) Administration of scheduled reports – Some reports that are to be provided by the SP will be delivered on an agreed upon schedule. The parameters for the schedule can be administered through requests provided by the SC.

k) Submission of ETS trouble reports – The SC experiencing a failure or problem with an ETS feature can issue a trouble report to the SP identifying the nature of the problem being experienced. A trouble report is essentially a request from the SC to the SP for corrective action to resolve the service problem. Upon receipt of a trouble report, the SP logs the report and initiates corrective action. During the corrective process and upon successful resolution of the trouble, the SP may provide status reports to the SC.

6.2.3 Management interactions initiated or provided by service provider

The following provides a narrative description of reports provided by the SP based upon the administered schedule or triggers. The reports are sent by the SP across the X-interface to the SC:

a) ETS usage reports – The SP reports on service usage could include statistical information about the actual usage of different types of service and areas of coverage for analysis purposes. These reports would be provided on a periodic schedule.

b) ETS security[1] event alerts – SP reports on security aspects when triggered by a specific event or change of status. The report could include identification of type of event, such as denial of service or attempted unauthorized access. The reports could include specific instances and locations of the security events.

c) ETS degradation alerts – SP reports on degradation of service when specific changes occur in the ETS quality of service level being provided. For example, a high volume of ETS traffic and/or limited bandwidth availability may lead to performance degradations. This type of alert will enable the SC and/or the SP to determine if some traffic types (e.g., video) or traffic levels should be controlled or limited.

[1] The term "Security" is not yet defined officially in the ITU, except when used in the X-series of Recommendations.

d) ETS status change alerts – SP reports on service status would be provided when the state of service changes, e.g., when a service failure occurs. The reports may include the overall status of ETS service performance including information about types of service, areas of coverage, etc.

6.3 Business level requirements (use-cases)

Basic requirements (in text form) for ETSMS are provided in 6.2. Clauses 6.3 and 6.4 identify the associated use-cases with actor/role and resources. The goal of these clauses is to define system requirements for the Emergency Telecommunication Service Management System shown on Figure 6-1. The requirement of the system under development, that is, what functionality must be provided by the system, is documented in a use-case model that illustrates the system's intended functions (use-cases), its surroundings (actors), and the relationships between the use-cases and actors (use-case diagrams). Note that actors are not part of the system; they represent anyone or anything that must interact with the system.

6.3.1 Actors

The only actor defined is that of the Service Customer (SC) as identified in Figures 6-1 and 6-2.

6.3.2 Telecommunication resources

The telecommunication resources used to provide ETS and ETSMS are described in 6.1 (e.g., see Figures 6-2 and 6-3).

6.3.3 High-level use-case diagrams

This clause contains high-level use-case diagrams that summarize the functionality and interfaces of the Emergency Telecommunication Service Management System as shown on Figure 6-1. The use-case diagrams are organized along the lines shown in Table 6-1, i.e., use-cases initiated by the SC are depicted first followed by use-cases initiated by the SP. Use-case descriptions are provided in 6.4 for every use-case pictured in these high-level diagrams.

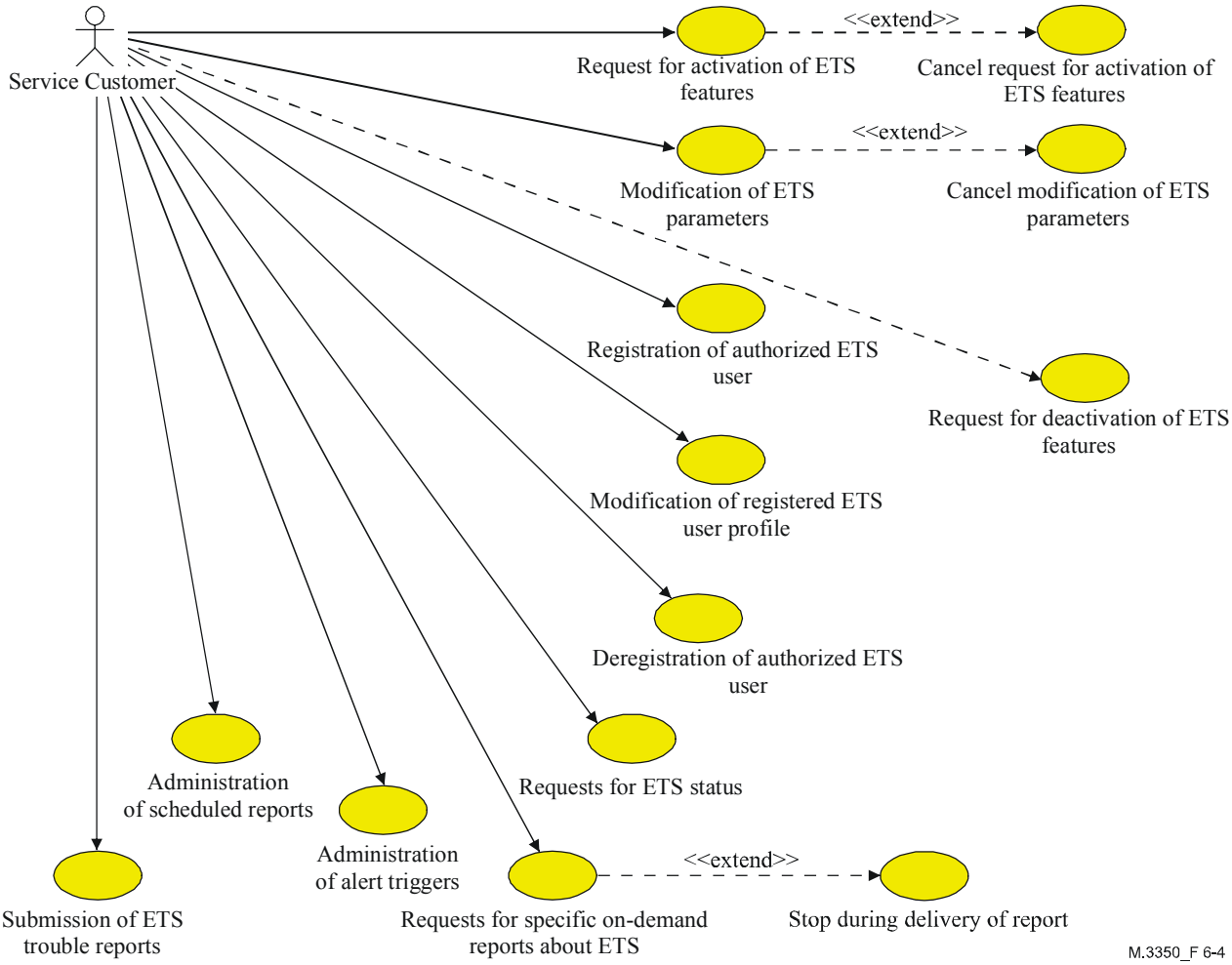

Figure 6-4/M.3350 – SC initiated use-cases

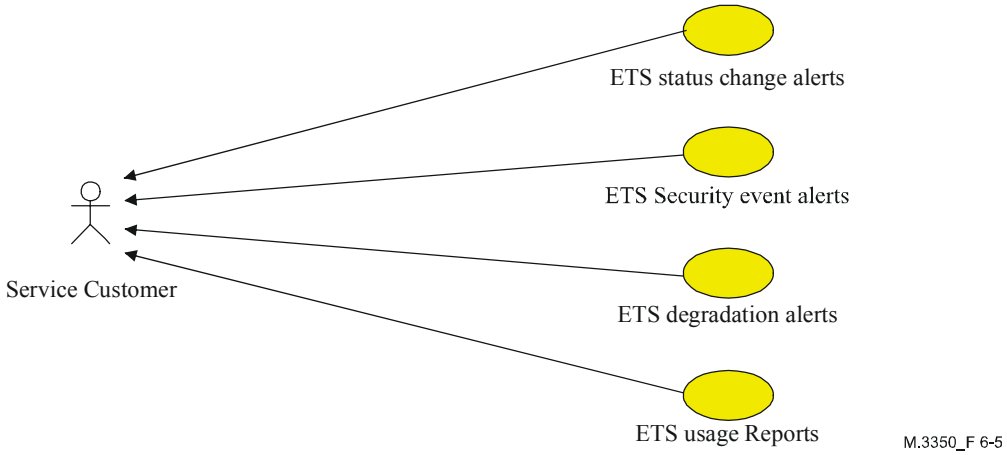

Figure 6-5/M.3350 – SP initiated use-cases

6.4 Specification level requirements

This clause contains textual details for each of the use-cases shown in the high-level use-case diagrams of the 6.3.3. The details are provided to clarify the roles of external actors and telecommunication resources and to refine the previous high-level use-case diagrams to a specification level. Use-case details include the following components:

Name	The name of the use-case (matches all drawing names).
Summary	A summary of the use-cases purpose and content.
Actor(s)	The names of actors involved in the use-case including role characteristic for each actor.
Assumptions	A description of the environment providing a context for the use-case.
Pre-conditions	A list of all system and environment conditions that must be true before the use-case can be triggered.
Begins when	The name of the single event that triggers the start of the use-case.
Description	The various tasks that make up the use-case, not necessarily in sequence. The description should reference any reuse of TMN functionality.
Ends when	The event(s) that signals that the use-case has terminated.
Exceptions	A summary list of all exception conditions and faults detected by the use-case during its operation.
Post-conditions	A list of all system and environmental conditions that must be true if the use-case has terminated without internal error.

The following subclauses provide the details for the use-cases shown on Figures 6-4 and 6-5.

6.4.1 Request for activation of ETS features

Name	Request for activation of ETS features
Summary	In situations where all ETS features are not always active, the SC activates one or more ETS features. The SP notifies the SC when the requested activation has completed. In terms of ITU-T Rec. X.731, *State management function*, activation of an ETS feature changes the administrative state of the ETS feature from "locked" to "unlocked".
Actor(s)	Service Customer (SC)
Assumptions	This use-case applies to situations where ETS is not always "available" for use and must be activated by specific request from the SC. The term "available" is used here to mean being made available administratively by the SP; it is not referring to the capability of the network to provide ETS. The ETS features are activated to enable authorized users to communicate for organizing and coordinating emergency recovery activities. Activated ETS features will allow registered users to access and use those ETS features. The ETS features can also be deactivated as requested by the SC (see 6.4.5). Only an authorized SC can request activation or deactivation.
Pre-conditions	An ETS network capability is in place and "available". The term "available" is used here to mean the network capability exists and is not experiencing a failure condition. A pre-defined ETS service contract has been established and the SC has been pre-authorized to perform this function.
Begins when	The SC requests activation of one or more ETS features.

Description	When the SC issues a request for ETS feature(s) activation, the SC will specify certain parameters as part of the request (e.g., identification of the ETS feature(s) to be activated, ETS parameter values associated with each ETS feature to be activated). Note that the SC may modify the ETS parameter values at a later time using the modification of ETS parameters use-case (see 6.4.3). When the requested ETS feature activation has completed, the SP notifies the SC that the requested ETS feature(s) are now "active".
Ends when	The SP notifies the SC that the requested ETS feature(s) is active.
Exceptions	– The ETS feature(s) was previously activated. – Requested feature or service not available. – Missing or incorrect parameter values. – The request originates from an unauthorized source. – A network problem exists.
Post-conditions	The state of the ETS feature(s) is "active", i.e., in terms of ITU-T Rec. X.731, its administrative state is "unlocked".

6.4.2 Cancel request for activation of ETS features

Name	Cancel request for activation of ETS features
Summary	The SC that submitted an earlier request for ETS feature activation (see 6.4.1) can cancel the request before the request is completed (as indicated by a completion notification issued by the SP).
Actor(s)	Service Customer (SC)
Assumptions	None
Pre-conditions	The SC has made an earlier request for ETS feature activation. Completion of the earlier request has not yet occurred, i.e., the request is in the "open/active" state as defined by Annex A.
Begins when	SC decides to cancel the original request.
Description	SC issues a cancellation request prior to completion of the earlier ETS feature activation request. If cancellation is successful, then SC is notified of success. If cancellation is unsuccessful, SC receives an exception report or confirmation that the original ETS feature activation request was successful.
Ends when	SC receives a success notification, an exception report, or an ETS feature activation confirmation.
Exceptions	– Original request has been completed (i.e., is in the "closed" state as defined by Annex A). – Too late to cancel. – The request originates from an unauthorized source.
Post-conditions	Original request is cancelled. A record of the original request and the cancellation may be kept available for future query (optional).

6.4.3 Modification of ETS parameters

Name	Modification of ETS parameters
Summary	The SC modifies one or more ETS parameters associated with an ETS feature.
Actor(s)	Service Customer (SC)
Assumptions	It may be necessary to change some parameters of the ETS features being used. For example, the area of coverage, service configuration, or types of service may need to be modified to accommodate specific situations that may arise. It is assumed that the state of the ETS feature for which ETS parameters are being modified is "active", however, it not necessarily assumed that activation/deactivation of the feature by the SC is allowed (see 6.4.1 and 6.4.5). Only an authorized SC can request modification of ETS parameters.
Pre-conditions	The state of the ETS feature for which ETS parameters are being modified is "active". A pre-defined ETS service contract has been established and the SC has been pre-authorized to perform this function.
Begins when	The SC requests modification of one or more ETS parameters associated with a specific ETS feature.
Description	When the SC issues a request for modification of ETS parameters, the SC will specify certain parameters as part of the request (e.g., identification of the ETS feature for which parameters are to be modified, new values for the ETS parameters to be modified, etc.). When the requested ETS parameter(s) modification has completed, the SP notifies the SC that the new ETS parameter value(s) that were requested are now in effect.
Ends when	The SP notifies the SC that the new ETS parameter value(s) are in effect.
Exceptions	– Missing or incorrect parameter values. – Requested feature not available. – The request originates from an unauthorized source. – A network problem exists.
Post-conditions	The parameter value(s) of the ETS feature for which modification was requested are updated.

6.4.4 Cancel modification of ETS parameters

Name	Cancel modification of ETS parameters
Summary	The SC that submitted an earlier request for ETS parameter modification (see 6.4.3) can cancel the request before the request is completed (as indicated by a completion notification issued by the SP).
Actor(s)	Service Customer (SC)
Assumptions	None
Pre-conditions	The SC has made an earlier request for ETS parameter modification. Completion of the earlier request has not yet occurred, i.e., the request is in the "open/active" state as defined by Annex A.
Begins when	SC decides to cancel the original request.

Description	SC issues a cancellation request prior to completion of the earlier ETS parameter modification request. If cancellation is successful, then SC is notified of success. If cancellation is unsuccessful, SC receives an exception report or confirmation that the original ETS parameter modification request was successful.
Ends when	SC receives a success notification, an exception report, or an ETS parameter modification confirmation.
Exceptions	– Original request has been completed (i.e., is in the "closed" state as defined by Annex A). – Too late to cancel. – The request originates from an unauthorized source.
Post-conditions	Original request is cancelled. A record of the original request and the cancellation may be kept available for future query (optional).

6.4.5 Request for deactivation of ETS features

Name	Request for deactivation of ETS features
Summary	In situations where ETS features are not always active, the SC can deactivate ETS features. The SP notifies the SC when the requested deactivation has occurred. In terms of ITU-T Rec. X.731, *State management function*, deactivation of an ETS feature changes the administrative state of the ETS feature from "unlocked" to "locked".
Actor(s)	Service Customer (SC)
Assumptions	See assumptions for the request for activation of ETS features use-case (see 6.4.1).
Pre-conditions	ETS features are in an "active" state (or "unlocked" per ITU-T Rec. X.731), e.g., a previous request for activation had been completed earlier (see 6.4.1).
Begins when	The SC requests deactivation of ETS features.
Description	When the SC issues a request for ETS feature deactivation, the SC will specify certain parameters as part of the request (e.g., identification of ETS feature(s) to be deactivated). Once the requested ETS feature(s) is deactivated, the SP notifies the SC that the deactivation is complete.
Ends when	The SP notifies the SC that the ETS feature(s) is deactivated.
Exceptions	– ETS feature was not previously activated. – SC cannot be properly authenticated.
Post-conditions	The ETS feature(s) is not in an activated state, i.e., in terms of ITU-T Rec. X.731, the administrative state of the ETS features is "locked".

6.4.6 Registration of authorized ETS user

Name	Registration of authorized ETS user
Summary	The SC registers with the SP a new authorized user (authorized to use one or more ETS features).
Actor(s)	Service Customer (SC)
Assumptions	The availability of emergency priority communication services is restricted to specifically authorized users supporting recovery operations. The SC generally does such registration in advance for those personnel identified as candidates for supporting emergency recovery operations. However, due to the unexpected occurrence and location of disaster situations there may be a requirement for real-time authorization, through a central coordination centre, of personnel needed immediately to support recovery operations. The SC can then pass the appropriate registration information to the SP so that timely authentication of valid users can be accomplished. The SC is responsible for determining whether or not a particular user is authorized. Once the SC registers an authorized user with the SP, the SP is responsible for authenticating this user at the time that the user attempts to access ETS features.
Pre-conditions	A pre-defined ETS service contract has been established and the SC has been pre-authorized to perform this function. Note that the SC may register users independently of whether or not ETS features have been activated (see 6.4.1).
Begins when	The SC requests registration of a new authorized user.
Description	When the SC issues a request to register a new authorized user, the SC will specify certain parameters as part of the request (e.g., friendly user name, unique userID, user PIN, ETS features that this authorization applies to, user priority level, etc.) When the user is registered, the SP notifies the SC that registration is complete.
Ends when	The SP notifies the SC that the new authorized ETS user has been registered.
Exceptions	– The user was previously registered. – The request originates from an unauthorized source. – Missing or incorrect parameter values. – Number of authorized users exceeded.
Post-conditions	New authorized ETS user is registered and a corresponding ETS user profile is maintained by the SP.

6.4.7 Modification of registered ETS user profile

Name	Modification of registered ETS user profile
Summary	The SC modifies the profile information for an authorized ETS user that has been registered with the SP.
Actor(s)	Service Customer (SC)
Assumptions	See assumptions for the registration of authorized ETS user use-case (see 6.4.6). Before requesting modification of a user profile, the SC may find it useful to "query" the user profile from the SP in order to verify the existing values of data items within the profile. It is assumed that this "query" will be supported even though it is not described via a separate use-case.
Pre-conditions	A registered ETS user profile exists with the SP, e.g., the registration of authorized ETS user had been completed earlier (see 6.4.6).
Begins when	The SC requests modification of a registered ETS user profile.
Description	When the SC issues a request to modify a registered ETS user profile, the SC will specify certain parameters as part of the request (e.g., unique userID, profile data items to be modified along with their new values, etc.). When the profile has been modified, the SP notifies the SC that the profile modification is complete.
Ends when	The SP notifies the SC that the requested profile modification has been completed.
Exceptions	– Missing or incorrect parameter values (i.e., profile data items). – User profile not found. – The request originates from an unauthorized source.
Post-conditions	The modified ETS user profile is maintained by the SP.

6.4.8 Deregistration of authorized ETS user

Name	Deregistration of authorized ETS user
Summary	An authorized ETS user that has been previously registered with the SP is deregistered by the SC.
Actor(s)	Service Customer (SC)
Assumptions	The population of authorized ETS users is dynamic and will change over time. This use-case allows deregistration of authorized ETS users. Clause 6.4.6 provides the use-case for registration of authorized ETS users.
Pre-conditions	A profile exists with the SP for the user to be deregistered, e.g., the registration of authorized ETS user had been completed earlier (see 6.4.6).
Begins when	The SC requests deregistration of an authorized ETS user.
Description	When the SC issues a request to deregister an authorized ETS user, the SC will specify certain parameters as part of the request (e.g., unique userID). When the ETS user is deregistered, the SP notifies the SC that deregistration is complete.
Ends when	The SP notifies the SC that the ETS user deregistration has been completed.
Exceptions	– User profile not found. – The request originates from an unauthorized source.
Post-conditions	The ETS user is deregistered and the corresponding profile is no longer maintained by the SP.

6.4.9 Requests for ETS status

Name	Requests for ETS status
Summary	The SC queries the SP to determine the operational state (defined in ITU-T Rec. X.731) of one or more ETS features.
Actor(s)	Service Customer (SC)
Assumptions	Anytime, the SC can request if specific ETS features are "available". The term "available" is used here to mean the network capability exists and is not experiencing a failure condition. Some ETS features may be active (i.e., in terms of ITU-T Rec. X.731, their administrative state is "unlocked"), but are not available because of limited network capacity. Other ETS features may only be activated upon specific request by the SC as indicated in 6.4.1. However, the SC could request the state of availability before the activation request is issued.
Pre-conditions	ETS network capabilities supporting ETS features are in place. Note that the ETS features may or may not be activated as defined in 6.4.1. A pre-defined ETS service contract has been established and the SC has been pre-authorized to perform this function.
Begins when	The SC sends a request for ETS status to the SP.
Description	When the SC sends a request for ETS status to the SP, the SC will specify certain parameters as part of the request (e.g., identification of the ETS feature(s) for which status is requested). The SP response to this query will include certain parameters (e.g., value of the operational state corresponding to each ETS feature for which status is requested, value of the administrative state corresponding to each ETS feature for which status is requested, etc.).
Ends when	SP response containing ETS status information is sent to SC.
Exceptions	– Invalid ETS feature identification. – The request originates from an unauthorized source.
Post-conditions	SC has received requested ETS status information.

6.4.10 Requests for specific on-demand reports about ETS

Name	Requests for specific on-demand reports about ETS
Summary	The SC requests that the SP start issuing one or more specific on-demand reports about ETS.
Actor(s)	Service Customer (SC)
Assumptions	The SC may request specific reports or specific sets of reports individually anytime. The SC may terminate the delivery of a report anytime as described in the stop during delivery of report use-case (see 6.4.11). Note that there is no size restriction on how large a report may be. Therefore, the SP may deliver the requested report to the SC in multiple parts. It is also possible for a report to have no defined ending (e.g., continuous report of data being monitored by the SP). This type of report would need to be stopped using the stop during delivery of report use-case (see 6.4.11).
Pre-conditions	A pre-defined ETS service contract has been established identifying what types of ETS reports may be requested by the SC. The SC has been pre-authorized to perform this function.
Begins when	SC sends a request to the SP to start issuing one or more specific on-demand reports about ETS.

Description	When the SC sends a request for on-demand reports about ETS to the SP, the SC will specify certain parameters as part of the request (e.g., type of report(s) for SP to send, etc.). The SP response to this request may occur in multiple parts. Each partial response notification will include certain parameters (e.g., identification of report type, report data, indication of whether or not this is the final part of the report, indication of how many more parts of the report will be coming subsequently, etc.).
Ends when	Final part of all reports requested has been sent to the SC by the SP, or when the stop during delivery of report use-case (see 6.4.11) occurs.
Exceptions	– Invalid report type requested. – The request originates from an unauthorized source.
Post-conditions	SC has received the on-demand reports about ETS that were requested, or has received partial report information up until the point that the stop during delivery of report use-case (see 6.4.11) occurred.

6.4.11 Stop during delivery of report

Name	Stop during delivery of report
Summary	The SC requests stoppage of on-demand reports about ETS that were previously started when the request for specific on-demand reports about ETS use-case occurred (see 6.4.10).
Actor(s)	Service Customer (SC)
Assumptions	See assumptions for the request for specific on-demand reports about ETS use-case (see 6.4.10).
Pre-conditions	The SC has previously started specific on-demand reports about ETS (see 6.4.10), and the final part of all reports requested has not yet been sent by the SP to the SC.
Begins when	SC sends a request to the SP to stop delivery of report(s) that have not yet been completed.
Description	When the SC sends a request to stop delivery of report(s) that have not yet been completed, the SC will specify certain parameters as part of the request (e.g., type of report(s) to stop, etc.). When the SP has stopped the specific report(s) for which stoppage was requested, the SP notifies the SC that the report stoppage has occurred.
Ends when	The SP notifies the SC that the report stoppage has occurred.
Exceptions	– On-demand report has already normally completed. – The request originates from an unauthorized source.
Post-conditions	No further parts of the stopped report(s) are sent to the SC.

6.4.12 Administration of alert triggers

Name	Administration of alert triggers
Summary	The SC administers (i.e., modifies) the trigger conditions that will cause an alert to be sent from the SP to the SC.
Actor(s)	Service Customer (SC)
Assumptions	Three alert types are defined in 6.4.15 through 6.4.17. The sending of an alert is triggered by some network event that is detected by the SP. This use-case allows the SC to administratively determine which network events will trigger the sending of an alert and which will not. This is accomplished by modifying the "alert trigger profile". Before requesting modification of the alert trigger profile, the SC may find it useful to "query" the alert trigger profile from the SP in order to verify the existing values of data items within the profile. It is assumed that this "query" will be supported even though it is not described via a separate use-case.
Pre-conditions	A pre-defined ETS service contract has been established identifying what types of alerts the SC may choose to receive and the set of triggers that the SC may select from to cause alerts to be sent. An alert trigger profile exists with the SP (e.g., set up by the SP with default values).
Begins when	The SC requests modification of the alert trigger profile.
Description	When the SC issues a request to modify the alert trigger profile, the SC will specify certain parameters as part of the request (e.g., alert type to be turned "on" or "off", profile data items/trigger conditions to be modified along with their new values, etc.). When the profile has been modified, the SP notifies the SC that the profile modification is complete.
Ends when	The SP notifies the SC that the requested profile modification has been completed.
Exceptions	– Missing or incorrect parameter values (i.e., profile data items). – Alert trigger profile not found. – Invalid trigger requested. – The request originates from an unauthorized source.
Post-conditions	The modified alert trigger profile is maintained by the SP.

6.4.13 Administration of scheduled reports

Name	Administration of scheduled reports
Summary	The SC administers (i.e., modifies) the trigger conditions (i.e., schedule) that will cause a scheduled report to be sent from the SP to the SC.
Actor(s)	Service Customer (SC)
Assumptions	One scheduled report type is defined in 6.4.18 (other scheduled report types may be defined in the future). "Scheduled reports" are reports that are to be provided by the SP and delivered on an agreed upon schedule. This use-case allows the parameters for the schedule to be administered through requests provided by the SC. This is accomplished by modifying the "reporting schedule". Before requesting modification of the reporting schedule, the SC may find it useful to "query" the reporting schedule from the SP in order to verify the existing values of data items within the schedule. It is assumed that this "query" will be supported even though it is not described via a separate use-case.

Pre-conditions	A pre-defined ETS service contract has been established identifying what types of reports the SC may choose to schedule and the set of parameters that the SC may select from in order to define the schedule. A reporting schedule exists with the SP (e.g., set up by the SP with default values).
Begins when	The SC requests modification of the reporting schedule.
Description	When the SC issues a request to modify the reporting schedule, the SC will specify certain parameters as part of the request (e.g., report type to be scheduled, data items to be modified along with their new values, etc.). When the reporting schedule has been modified, the SP notifies the SC that the schedule modification is complete.
Ends when	The SP notifies the SC that the requested schedule modification has been completed.
Exceptions	– Missing or incorrect parameter values (i.e., schedule data items). – Reporting schedule not found. – Invalid report type requested. – The request originates from an unauthorized source.
Post-conditions	The modified reporting schedule is maintained by the SP.

6.4.14 Submission of ETS trouble reports

ETSMS shall include the trouble management function for ITU-T applications as specified by ITU-T Rec. X.790. The following capabilities (as specified by ITU-T Rec. X.790) shall be available to the Service Customer:

- Trouble report creation;
- Tracking trouble reports;
- Management of trouble reports;
- Trouble report clearing and closure.

6.4.15 ETS status change alerts

Name	ETS status change alerts
Summary	The SP detects a change in the status (e.g., failure occurs) of ETS service and alerts the SC of this condition.
Actor(s)	Service Customer (SC)
Assumptions	SP reports on status of ETS service would be provided when the state of service status changes, and when there is a service failure. The reports could cover the overall status of service performance including types of service and areas of coverage.
Pre-conditions	A pre-defined ETS service contract has been established identifying what types of ETS service status information may be made available to the SC via ETS status change alerts. The SC has administratively requested to receive ETS status change alerts (e.g., via the administration of alert triggers use-case defined in 6.4.12).
Begins when	The SP detects a change in the status (e.g., failure occurs) of ETS service that may be made available to the SC.

Description	The SP issues an alert notification to the SC. The notification will include certain parameters (e.g., description of the ETS status change that occurred).
Ends when	The SC receives ETS status change alert.
Exceptions	None
Post-conditions	SC is informed of ETS status change.

6.4.16 ETS security event alerts

Name	ETS security event alerts
Summary	The SP detects a security-related event and alerts the SC of this condition.
Actor(s)	Service Customer (SC)
Assumptions	SP reports on security aspects when triggered by a specific event or change of status. The report could include identification of type of event, such as denial of service or attempted unauthorized access. The reports could include specific instances and locations of the security events. If ETS service is degraded due to the security-related event being reported, then ETS degradation alert may also be issued (see 6.4.17).
Pre-conditions	A pre-defined ETS service contract has been established identifying what types of ETS security event alerts may be made available to the SC. The SC has administratively requested to receive ETS security event alerts (e.g., via the administration of alert triggers use-case defined in 6.4.12).
Begins when	The SP detects a security-related event that may be made available to the SC.
Description	The SP issues an alert notification to the SC. The notification will include certain parameters (e.g., description of the security-related event detected, impact of the event on ETS service if known, etc.).
Ends when	The SC receives the ETS security event alert.
Exceptions	None
Post-conditions	SC is informed of the security-related event.

6.4.17 ETS degradation alerts

Name	ETS degradation alerts
Summary	The SP detects that one or more ETS Quality of Service (QoS) parameter values have degraded below the values specified in the SLA and alerts the SC of this condition.
Actor(s)	Service Customer (SC)
Assumptions	As SP resources become unavailable (e.g., due to SP network infrastructure and service failures, or due to SP network infrastructure security breaches, or due to heavy traffic), the ETS QoS that is normally expected for the specific mode of communication could progressively degrade below the values specified in the SLA. The ETS SLA may include a policy definition by which the SC and the SP agree that under such conditions the SP might automatically apply traffic controls in the network. Alternatively, the SP response might be to just put all ETS services on a best effort basis. However, traffic controls may be used in order to limit only the most bandwidth-demanding traffic (e.g., video broadcast) in order to preserve effective interchange of the most critical information in a message format. A graceful response could be progressive, starting with high bandwidth services, and continuing (if necessary) by selectively restricting the narrow-band command and control type of interchange. Flexibility is needed in the definition of the data elements to cover a range of possibilities.

Pre-conditions	A pre-defined ETS service contract (i.e., SLA) has been established with defined QoS parameters and values. The SC has administratively requested to receive ETS degradation alerts (e.g., via the administration of alert triggers use-case defined in 6.4.12).
Begins when	The SP detects that one or more ETS QoS parameter values have degraded below the values specified in the SLA.
Description	The SP issues an alert notification to the SC. The notification will include certain parameters (e.g., the current QoS parameter values that have been detected, any traffic controls that may have been put in effect by the SP in response to the degradation, etc.).
Ends when	The SC receives the ETS degradation alert.
Exceptions	None
Post-conditions	SC is informed of ETS QoS degradation and SP response to degradation (when applicable).

6.4.18 ETS usage reports

Name	ETS usage reports
Summary	The SP provides ETS usage reports to the SC on a periodic schedule.
Actor(s)	Service Customer (SC)
Assumptions	The SP reports on ETS service usage could include statistical information about the actual usage of different types of service and areas of coverage for analysis purposes. Usage data may be broken down by individual ETS user, by ETS feature, or by other categories meaningful to the SC. These reports would be provided on a periodic schedule.
Pre-conditions	A pre-defined ETS service contract has been established identifying what types of ETS usage reports may be made available to the SC. The SC has administratively set up a schedule to receive ETS usage reports identifying the types of reports to be sent and the schedule for issuing the reports, e.g., via the administration of scheduled reports use-case defined in 6.4.13.
Begins when	Date/time for issuing a report is reached (according to the schedule previously established by the SC).
Description	The SP sends an ETS usage report to the SC. The report notification will include certain parameters (e.g., identification of report, time sent, etc.).
Ends when	The SC receives the ETS usage report.
Exceptions	None
Post-conditions	SC is informed of ETS usage.

7 Interface requirements

Crisis situations that require immediate recovery operations to save lives, restore the community infrastructure, and bring the population back to normal living conditions can happen unexpectedly anyplace at anytime. Therefore, it is imperative that personnel deployed for recovery operations be able to utilize resources that are readily available and within convenient reach. Specialized operational resources will very likely not be at hand immediately to facilitate recovery operations. Establishment of interfaces between emergency operations SCs and the SP of public telecommunication resources that are widely and commonly available are highly desirable. Consideration needs to be given to the human interface to ensure that it is simple, but effective. For example, the use of a basic web browser could provide a commonly and easily used means of fulfilling the requirements for interchange of critical service management information between

disaster relief operations SCs and telecommunication SPs as described in clause 6. The specification for the interface requirements is a subject of other ITU-T Recommendations.

Another critical factor for establishing an efficient and effective interface for interchange of service and network management information between TMNs across the X-interface is standardization of data elements that represent appropriate information associated with emergency recovery operations. Standardized data elements for management information interchange need to be identified for application to disaster relief operations. In addition, specialized data elements may need to be defined and standardized that would apply uniquely to emergency recovery operations. The definition of the appropriate data elements for emergency communications will be specified by other ITU-T Recommendations.

Annex A

ETS request state model

This annex describes an ETS request state model applicable to the following use-cases:

- Cancel modification of ETS parameters (see 6.4.4)
- Cancel request for activation of ETS features (see 6.4.2)
- Modification of ETS parameters (see 6.4.3)
- Request for activation of ETS features (see 6.4.1).

The ETS request state model is based on (and simplified from) the request state model found in ITU-T Rec. M.3208.1.

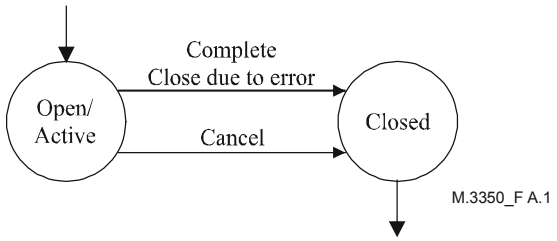

Figure A.1/M.3350 – Request state model

Table A.1/M.3350 – State transition table for request state model

Event	Current state	
	Open/Active	Closed
complete	service request completed ⇒ closed	
error	emit error event ⇒ closed	
cancel	closed	

NOTE – All requests (Modification of ETS parameters, Request for activation of ETS features) begin in the "Open/Active" state.

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