Recommendation X.353

ROUTING PRINCIPLES FOR INTERCONNECTING PUBLIC MARITIME

MOBILE SATELLITE DATA TRANSMISSION SYSTEMS

WITH PUBLIC DATA NETWORKS

(Malaga-Torremolinos, 1984; amended at Melbourne, 1988)

The CCITT,

considering

(a) that a Public Maritime Mobile Satellite Service is now being operated by the International Maritime Satellite Organization (INMARSAT);

(b) that the mobile subscribers may have access to the service through a number of coast earth stations located in different countries;

(c) that interworking between the mobile satellite data transmission systems and the public data networks is required;

(d) that Recommendation X.110 specifies routing principles for international data services, Recommendation X.121 specifies the international numbering plan for public data networks and Recommendation E.215/F.215 provides for internationally unique mobile earth station identification;

(e) that new mobile systems for maritime and aeronautical applications are being defined,

unanimously recommends

that the following routing principles should apply for setting up calls between subscribers of the public data networks and users of international public maritime mobile satellite data transmission systems.

1 General

1.1 *Definitions*

Figure 1/X.353 shows the composition of systems in the Public Maritime Mobile Satellite Service. For definition of the various elements see Recommendation X.350.

The mobile satellite data switching exchange (MSDSE) is defined in ¤ 1.7 of Recommendation X.350.

1.2 *Role of the MSDSE*

A MSDSE will at the same time act as an international gateway and as an interface to the mobile earth stations. Within an ocean area a public maritime mobile earth station may set up or receive data calls from any MSDSE in that region. Each ocean area may contain a number of MSDSEs.

One MSDSE may have access to more than one satellite, and thus may serve more than one ocean area.

One MSDSE may serve one or more public maritime mobile systems.

The MSDSE may be connected to more than one international data switching exchange (IDSE) in a PDN. The MSDSE may also be connected to IDSEs in different PDNs.

This Recommendation assumes that a PDN does not connect to more than one MSDSE serving the same ocean area and Public Maritime Mobile Satellite System (such as INMARSAT Standard A, B and C).

2 Routing of mobile earth station originated calls

2.1 *A public maritime mobile earth station calling a land network subscriber*

The mobile earth station selects one MSDSE in the ocean area by signalling procedures defined within the mobile satellite service. The mobile user should be advised to place the call through an MSDSE which is near to the called subscriber in order to avoid long terrestrial routes.

The public maritime mobile earth station subscriber provides the international data number of the called subscriber to the MSDSE which will forward the call through its associated IDSE (or through the most appropriate IDSE if the MSDSE is connected to more than one IDSE).

Figure 1/X.353 - CCITT 55181

2.2 A public maritime mobile earth station calling another *mobile earth station*

If the two public maritime mobile earth stations are in the same ocean area or are in different ocean areas covered by the same MSDSE, the MSDSE sets up the call directly to the called public maritime mobile earth station so that only one MSDSE will be involved in the call.

Note - If the MSDSE does not have full switching capability, the call will first be routed to its associated IDSE and then back again to the MSDSE.

If the two public maritime mobile earth stations are in different ocean areas which are not both covered by the same MSDSE, the calling MSDSE will route the call in accordance with ¤ 2.1 above.

2.3 Routing of special service requests

Certain services (e.g., access to data bases for navigational warnings, weather forecasts, etc.) may be accessed by use of special short number codes defined within the public maritime mobile satellite systems. Such abbreviated codes require conversion to the full international data number before the call can be forwarded from the MSDSE to a PDN.

2.4 *Information provided to mobile earth stations*

Administrations operating MSDSEs should prepare and maintain information for mobile earth stations with regard to the administration's routing capabilities towards various destinations.

3 Routing of land originated calls to public maritime mobile earth stations

3.1 *Routing principles*

According to Recommendation X.121, one DNIC is allocated for each ocean area. The structure of these DNICs is 111S where S specifies the ocean area. The values assigned are found in Recommendation X.121.

Further, the first digit of the following Network Terminal Number in the public maritime mobile-satellite system is the ÒTÓ digit defined in Recommendation E.215/F.125 which is used for discrimination between different public maritime mobile satellite systems.

A calling user can only indicate which ocean area and public maritime mobile satellite systems (such as INMARSAT Standard A, B and C) type is addressed, and cannot select a specified MSDSE. Therefore each originating and/or transit network has normally to route data calls within one of the public maritime mobile system DNICs to pre-determined MSDSE which serves the ocean area and system type as indicated by the DNIC and T digit according to bilateral agreement between the administration of origin and the administration operating the MSDSE. Thus, analysis of five digits of the called number is required for routing purposes.

Similar agreements need to be made with administrations operating transit networks which will be involved in establishing the connection.

Situations may arise when two administrations are using the same transit network for routing their calls to two different MSDSEs within the same ocean area, i.e., two MSDSEs with the same DNIC and T digit. This will be solved by routing the call according to the DNIC of the administration of origin.

3.2 *Routing on facility field information*

If the MSDSE (or the associated transit network) does not provide for a given facility, the administration may choose to set up calls requesting such a facility via another MSDSE or transit network than that normally used by the administration rather than barring the call.

3.3 *Re-routing of calls at the MSDSE*

MSDSEs that have access to two satellites may have the capability of re-routing calls between the coverage areas of the two satellites. The re-routing of calls by the MSDSE enables a land user to have calls re-routed to another data number (but to the same public maritime mobile earth station), which only differs in ocean area, when a mobile earth station is absent from the ocean area indicated by the original data number. The re-routing of a call between the two ocean areas covered by the MSDSE should be carried out only once.

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The condition for re-routing is that the public maritime mobile earth station is included in the list of earth stations and is not barred from incoming access.

The DNIC to be returned as part of the called line identification, or whether a called line identification should be returned in such cases, is for further study.

General re-routing of calls based on the information contained in a mobile satellite location register is desirable. This may require changes to existing X-Series Recommendations and to the public maritime mobile satellite system specifications and is therefore left for further study.

Note - See also ¤ 3.1.

4 Group calls

In general, calls with a group address (as defined in Recommendation E.215/F.125) should be barred. Such addresses are public maritime mobile earth station numbers with a T digit 0. The call should preferably be barred in the network of origin. However, the MSDSE must in any case be capable of barring such calls. (See also Recommendation X.350.)

5 Use of satellite links

The link between the coast earth station and a public maritime mobile earth station is always a satellite link.

To provide acceptable Quality of Service, a limited number of satellite links should be permitted on a data connection. (See Annex B to Recommendation X.110.)

Hence, for a call destined to a public maritime mobile earth station, all transit exchanges should recognize from the destination DNIC of 111S that the final link is a satellite link and perform routing so that the maximum permitted transit delay from the calling user to the called user is not exceeded.

Note - The mechanism for a transit network to determine the transit delay already experienced in setting-up a call is for further study.