

The main reason for the difference between the amounts of data sent and received was duplication of messages. This duplication was caused by the aforementioned simultaneous use of different communications methods among the EIDCs. Even though the amount of duplicate messages was considerably reduced during Phase 3 compared with earlier stages of GSETT-2, the duplicate messages accounted for about 15 per cent of the total data volume. The presence and handling of these messages in their databases was not a major problem for the EIDCs; still, it represented an added load, and extra care should be taken in possible future experiments to avoid this situation, which appears in particular to result from the handling of message requests.

Loss of data in the communications circuits is another reason for differences between the amounts of data transmitted and received. The EIDCs performed, on a daily schedule during GSETT-2, comparisons of their message logs to overcome discrepancies between message databases. This procedure revealed that about 1 per cent (the figure was a little higher for Moscow) of the total volume of messages was initially missing in the databases of each of the EIDCs. After completing this reconciliation process with an exchange among EIDCs of missing messages, the discrepancies between what was sent from the NDCs and what was eventually contained in the EIDC data bases were minimal. This meant that the number of cases in which NDC messages did not reach any of the EIDCs was very low. In any case, it was possible for missing messages to be identified from the sequence numbering system adopted, and thus requests for retransmission of missing data were sent to the message originator.

Data compression schemes were successfully used by the majority of the participating countries. Relative to uncompressed data, this reduced the data volume by approximately half, without loss of information content.

Statistics on message "travel times" (the difference between the time a message reached the recipient and the sending time reported in the message header) show that the majority of the links performed in a timely manner, such that the GSETT-2 schedules could be adhered to. There were, however, several occasions on which the message travel times were surprisingly long, also for high-speed connections, causing message arrival after the deadline. Most of these late messages were, however, incorporated at a later time and are reflected in the event bulletins. Still, these cases should be further investigated in order to fully understand the nature and causes of the delays, and to gain further experience for future tests.

5.5 Conclusions

Overall, the communications network established for GSETT-2, comprising links between NDC and EIDCs as well as inter-EIDC links, worked very well. With very few exceptions, the elements of this network fulfilled the basic objective of enabling the reliable and expeditious exchange of large amounts of seismic data and other messages.