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Visibility data interchange among logistics information service providers

ISO/TC 154

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Foreword

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This document was prepared by Technical Committee ISO/TC 154, *Processes, data elements and documents in commerce, industry and administration*.

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Introduction

Visibility of logistics flow and a simple and trusted way to find the precise logistics information are very important for logistics in international trade.

However, the logistics data to be obtained by the logistics operator is often provided by several logistics information service providers (LISP) and other logistics parties. Although international standards (such as UN/EDIFACT) have existed for decades and many national and regional systems have been implemented based on these international standards, LISPs are often developed in isolation and fragmentation based on its own business requirements; and this leads to different interpretations of standard messages. A logistics information service framework should be specified for the visibility of logistics flow.

This document specifies a framework to clarify logistics visibility data and how it should be interchanged among different LISPs. This document can be used by LISPs for establishing data connections with other logistics information service systems and for satisfying different data providers' and data users' requirements. Logistics authorities and data users can also use this document to track the logistics flow and optimize their services.

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Visibility data interchange among logistics information service providers

1 Scope

This document specifies logistics visibility data, data elements, interchange message, and framework of logistics information service providers (LISP) interconnection. This document is applicable to regional and inter-regional logistics data interchange services of transport means and goods management in maritime, road, air, and railway import/export transportation.

2 Normative references

There are no normative references in this document.

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1.1

data provider

party that provides logistics data to a *logistics information service provider (LISP)* ([3.1.3](#))

3.1.2

data user

party that accesses logistics data from the *logistics information service provider (LISP)* ([3.1.3](#)) framework

3.1.3

logistics information service provider

LISP

party that provides the services of a platform for the electronic exchange of logistics information in the supply chain for increased efficiency and effectiveness

3.1.4

logistics visibility data

data that constitute logistics event status in import/export logistics procedure, covering the event data relating to the mode of transport, cargo and means of transport, B2B (business-to-business), G2B (government-to-business), B2G (business-to-government), public or private interests

Note 1 to entry: Visibility data is sorted in each event.

3.1.5

logistics visibility data interchange

data interchange for accurate and efficient logistics tracking and traceability

3.1.6

interconnection

connected status between *logistics information service providers (LISPs)* (3.1.3)

Note 1 to entry: The visibility data interchanged among LISPs are interconnected, so the connected status among LISPs is interconnection.

3.1.7

other receiver

party that receives a copy of a message when a document sender sends the message to a document receiver

3.2 Abbreviated terms

| | |
|--------|--|
| API | application programming interface |
| CCS | cargo community system |
| IMO | International Maritime Organization |
| PCS | port community system |
| UN/CCL | United Nations Core Components Library |
| WCO | World Customs Organization |

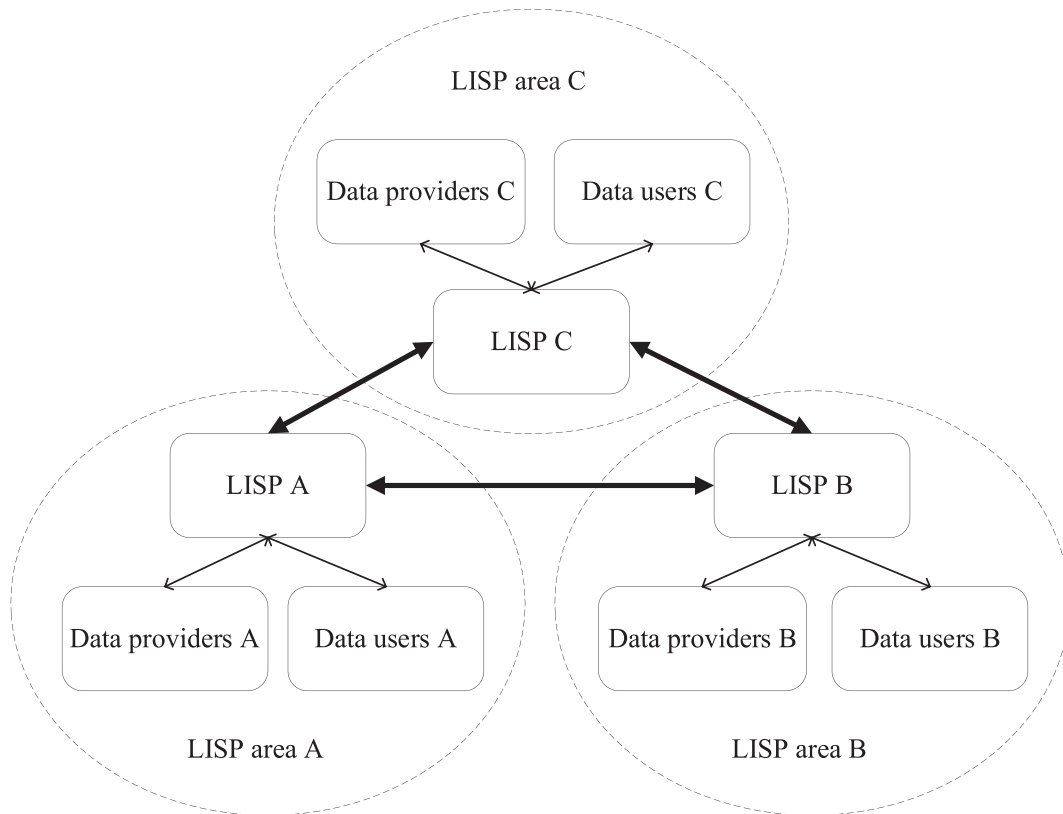
4 Framework of logistics information service providers interconnection

4.1 Interconnected relations

4.1.1 Overview

As it is shown in [Figure 1](#), the framework of LISP interconnection consists of regional LISP interconnection and inter-regional LISP interconnection.

- A single LISP provides regional LISP interconnection.
- Multiple LISPs provide inter-regional LISP interconnection through APIs.



NOTE The connecting lines refer to APIs.

Figure 1 — Framework of LISP interconnection

4.1.2 Regional LISP interconnection

Regional LISP interconnection includes:

- LISP [ISO/FDIS 23355](https://standards.iteh.ai/catalog/standards/iso/38d26609-5420-4e44-9d0e-6c2abd063436/iso-fdis-23355)
- Data providers
- Data users

Data providers are connected to a LISP in the same region and provide the logistics data to the LISP. Data users are connected to a LISP in the same region and access logistics data from the LISP. For example, there are three regional LISP interconnections in [Figure 1](#): LISP area A, LISP area B and LISP area C. In LISP area A, data providers A provide the logistics data to LISP A, and data users A access logistics data from LISP A.

4.1.3 Inter-regional LISP interconnection

Inter-regional LISP interconnection includes:

- Multiple LISPs
- Data providers in different regions
- Data users in different regions

Inter-regional LISP interconnection can be provided by multiple LISPs through APIs. Data users connected to a LISP can access logistics data from other regions by inter-regional LISP interconnection. For example, as it shown in [Figure 1](#), data users A can access logistics data from LISP area B and LISP area C, which are provided by data providers B and data providers C.

4.1.4 Classification of parties in LISP framework

The parties in LISP framework are shown in [Table 1](#).

Table 1 — Example of Parties in LISP Framework

| Party | Example of parties |
|---------------|---|
| LISP | <ul style="list-style-type: none"> a) PCS and CCS b) Logistics data exchange platform |
| Data provider | <ul style="list-style-type: none"> a) Maritime carrier b) Freight forwarder c) Port/Terminal operator d) Single window e) PCS and CCS f) Logistics data exchange platform |
| Data user | <ul style="list-style-type: none"> a) Maritime carrier b) Freight forwarder c) Port/Terminal operator d) Single window e) PCS and CCS f) Logistics data exchange platform |

4.2 Features

The framework of LISP interconnection should include 7 features.

- a) Openness: Any of LISPs can participant in this network to provide and acquire logistics status information mutually. They are information contributor, at the same time, they are information consumer.
- b) Confidentiality: To protect sensitive information of participated parties, information exchange shall be conducted with the prerequisite of data providers' consent.
- c) Systematicness: APIs are used for authentication and providing/querying logistics status information mutually. This feature reduces the cost of system implementation for both data providers and data users.
- d) Distribution: Providing services with a distributed database, store and replicate data based on a distributed framework.
- e) Convenience: The latest logistics data sharing and query service between LISP in different regions can be realized by using APIs.
- f) Effectiveness: With the latest logistics status information, this framework can achieve the visual tracking and traceability of logistics events, thereby ensuring accurate and efficient logistics information service data interchange.
- g) Inter-region: The logistics visualization data can be tracked across borders and regions to ensure successful sharing and access of logistics event status data in different countries and regions.

5 Visibility data of logistics information service

5.1 Logistics import/export process

According to the general logistics import/export process, visibility data are streamlined as events in chronological order. Integrating maritime, air, railway and road transport, there are 10 events on the import process, as shown in [Figure 2](#); on the export process, there are 9 events, as shown in [Figure 3](#).

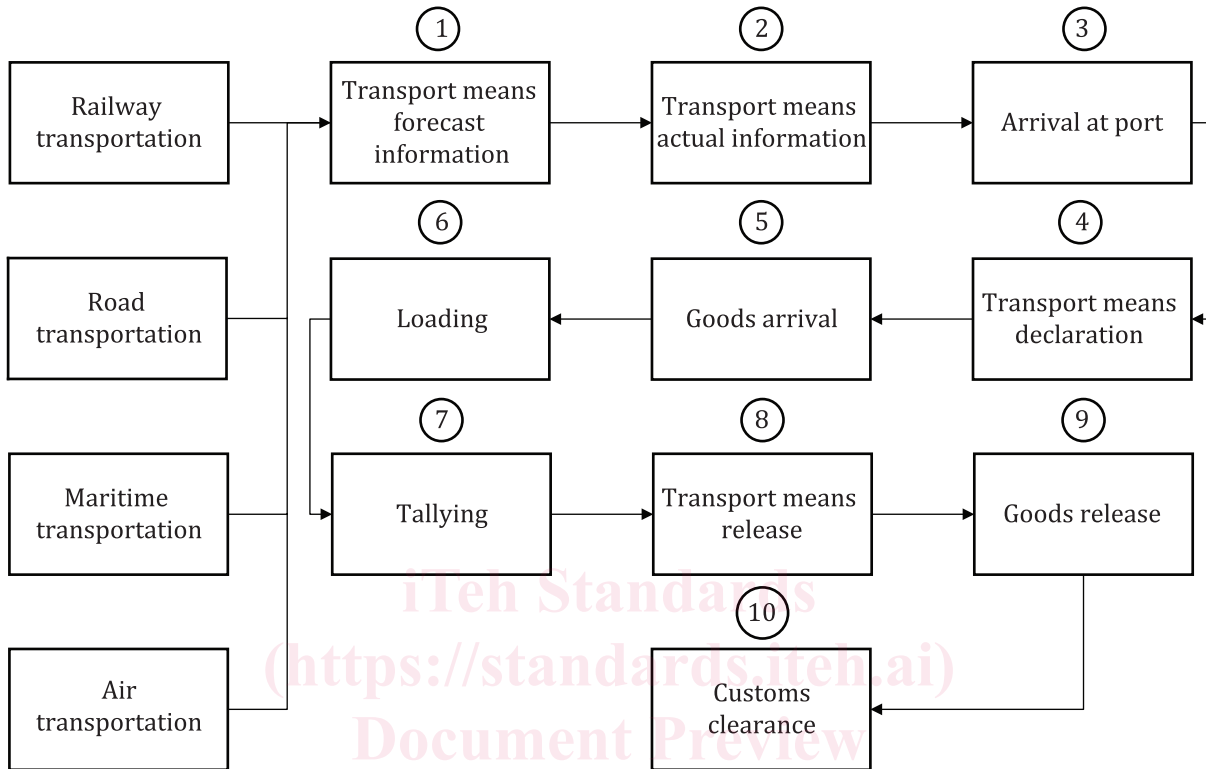


Figure 2 — Import process

<https://standards.iteh.ai/catalog/standards/iso/38d26609-5420-4e44-9d0e-6c2abd063436/iso-fdis-23355>

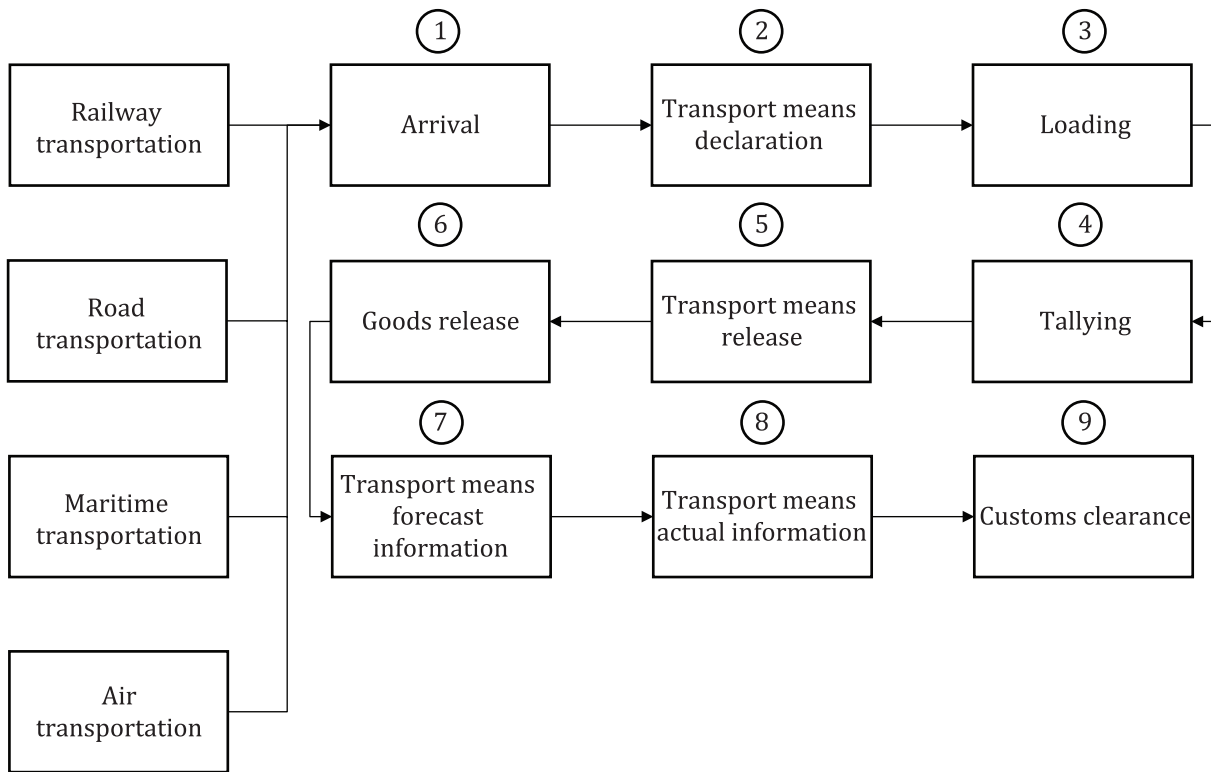


Figure 3 — Export process

5.2 Logistics import/export status

5.2.1 Import

- Transport means forecast information: Before the transport means enters the country (location), the transportation enterprise shall pre-declare relevant dynamic data.
- Transport means actual information: When the transport means enters the country (location), the transportation enterprise shall declare relevant dynamic data.
- Arrival at port (location): When the transport means enters the country (location), the transportation enterprise shall declare the actual dynamic data of a transport means arrival (location).
- Transport means declaration: When the transport means arrives at inbound location, the transportation enterprise shall declare the transport means, passengers, crews, items and other information carried by the transport means.
- Goods arrival: When goods arrive the inbound location supervision site, the declaration of goods and the corresponding transport means are carried out by the local enterprise.
- Loading: When goods leave the inbound location supervision site, the declaration of goods and the corresponding transport means are carried out by the local enterprise.
- Tallying: When goods arrive at the designated supervision site, the site enterprise completes the inventory and declares goods.
- Transport means release: After customs formalities have been completed, the transport means carrying import and export goods shall be released with the permission of the customs.
- Goods release: After the customs accepts the declaration of import and export goods, examines electronic data declaration forms, paper declaration forms and accompanying documents, examines the

goods, levies taxes or accepts guarantees, it shall make a decision to terminate the on-site supervision of import and export goods and allow goods to leave the on-site supervision of the customs.

- j) Customs clearance: Customs clearance is a procedure after customs release. After the goods enter the country, the customs check the accuracy and authenticity of the imported cleaning manifest data and confirms the verification manifest data.

5.2.2 Export

- a) Arrival: When export goods arrive at the supervision site of the outbound location, the declaration of goods and the corresponding transport means are carried out by the local enterprise.
- b) Transport means declaration: When the transport means arrives at the outbound location, the transportation enterprise shall declare the passengers, crews, items and other information carried by the transport means.
- c) Loading: When goods leave the supervision site of the outbound location, the declaration of goods and the corresponding transport means are carried out by the local enterprise.
- d) Tallying: When goods arrive at the designated supervision site, the site enterprise completes the inventory and declares goods.
- e) Transport means release: After customs formalities have been completed, the transport means carrying export goods shall be released with the permission of the customs.
- f) Goods release: After the customs accepts the declaration of export goods, examines electronic data declaration forms, paper declaration forms and accompanying documents, examines the goods, levies taxes or accepts guarantees, it shall make a decision to terminate the on-site supervision of export goods and allow goods to leave the on-site supervision of the customs.
- g) Transport means forecast information: Before the transport means enters the destination country (location), the transportation enterprise shall pre-declare relevant dynamic data.
- h) Transport means actual information: When the transport means enters the destination country (location), the transportation enterprise shall declare relevant dynamic data.
- i) Customs clearance: Customs clearance is a procedure after the export declaration. After the goods leave the country, the customs check the accuracy and authenticity of the export cleaning manifest data and confirms the verification manifest data.

5.3 Logistics visibility data interchange message

5.3.1 Overview

In logistics export/import process, 10 events on the import process and 9 events on the export process are streamlined respectively. Regardless the direction of logistics flow, these 19 events are compiled into 6 messages, as shown in [Table 2](#).

Table 2 — Process refinement into messages

| Message name | Import process | Export process |
|---|--------------------------------------|--------------------------------------|
| Forecast information message | Transport means forecast information | Transport means forecast information |
| Actual information message | Transport means actual information | Transport means Actual information |
| Arrival report message | Arrival at port (location) | Arrival |
| Tally message | Tallying | Tallying |
| Goods loading message | Loading | Loading |
| Transport means and goods release message | Transport means release | Transport means release |
| | Goods release | Goods release |

5.3.2 Interchange message

Six kinds of logistics visibility data interchange message should be used for logistics import/export information service data interchange, as shown in [Figure 4](#).

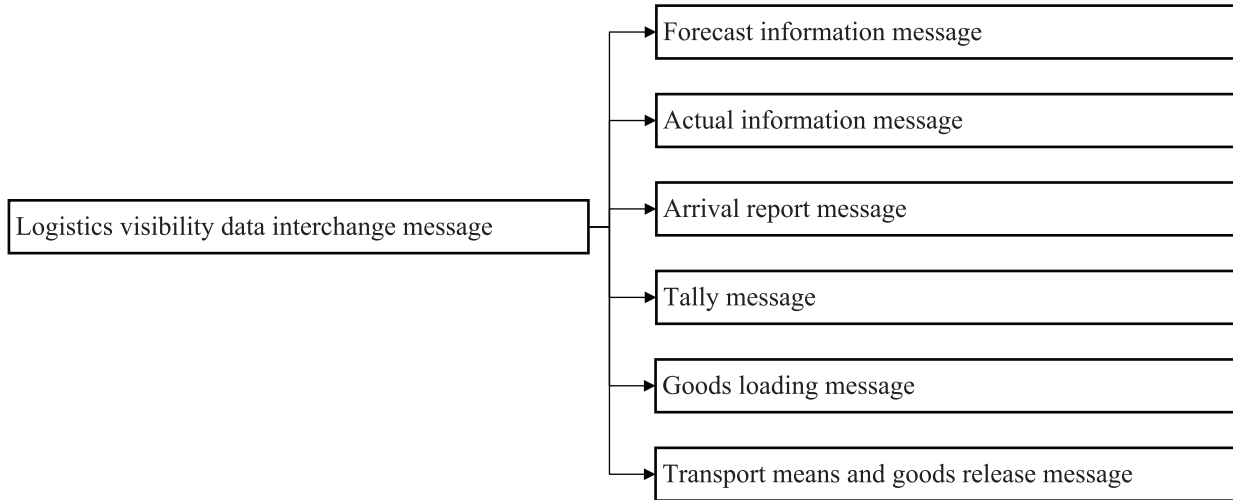


Figure 4 — Logistics visibility data interchange message

6 Messages of visibility data interchange between LISPs

6.1 Message content attribute description

6.1.1 Description of character representations

[Table 3](#) provides the descriptions of the character attributes.

Table 3 — Descriptions of character representations

| | |
|------|--|
| n | numeric characters |
| an | alphabetic and numeric characters |
| ..35 | variable data unit size where "35" indicates the maximum number of available character positions |
| M | mandatory |
| O | optional |
| M/O | M/O, O/M appear in pairs in the table, two ways to fill in: choose one of the data items to fill in, or choose both data items to fill in. |
| O/M | |

6.1.2 Occurrence number of data elements

The way to indicate the number of repetitions of data elements in messages is as follows: