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*Original*

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## **General principles governing the preparation and administration of coding**

*Principes généraux réglant l'établissement et la gérance des codifications  
Allgemeine Grundsätze für die Aufstellung und Geschäftsführung der Codierung*



UNION INTERNATIONALE DES CHEMINS DE FER  
INTERNATIONALER EISENBAHNVERBAND  
INTERNATIONAL UNION OF RAILWAYS

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All members of the International Union of Railways and OSJD

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<b>1st edition, January 1969</b>	First issue, published as Leaflet 920A with the title "General principles governing the preparation and administration of leaflets relating to standard numerical codes"
<b>2nd edition, April 1976</b>	Published with the title "General principles governing the preparation and administration of codings"
<b>3rd edition, January 1990</b>	-
<b>4th edition, January 1997</b>	-
<b>5th edition, June 2004</b>	Complete overhaul of Leaflet. Retyped in FrameMaker.

*The person responsible for this leaflet is named in the UIC Code*

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## Summary

The purpose of this leaflet is to specify the principles and conditions for the creation, examination, administration and maintenance of coding of information used by the members of the UIC and/or OSJD for the processing of traffic, transport and other documents and for exchanges of information regarding international freight and passenger transport as well as infrastructure management.

# 1 - Purpose of the leaflet

**1.1** - The purpose of this leaflet is to specify the principles and conditions for the creation, examination, administration and maintenance of coding of information used by the members of the UIC and/or OSJD for the processing of traffic, transport and other documents and for exchanges of information regarding international freight and passenger transport as well as infrastructure management.

**1.2** - This leaflet is based on the need to unify the coding of information in UIC and OSJD, in order to organise the exchange of information between railway undertakings and/or infrastructure managers and to create the conditions for the establishment of standardised databases at international level.

**1.3** - This leaflet is based on the premise that the object of coding is data elements and/or groups of elements in blocks of data (strings, segments).

Standards for coding of information and international information exchanges between railway undertakings and/or infrastructure managers are specified in special normative documents - leaflets, based either on:

- railway standards produced specially for the railway companies in common by the UIC and OSJD, or
- general standards, produced by international organisations (e.g. ISO, UN, W3C).

These leaflets define:

- the principles, methods, conditions and rules for coding data elements and how they fit into groups, blocks of data and messages;
- the principles, conditions and rules for information exchange between UIC and/or OSJD members;
- catalogues, lists and libraries, which include information about coded elements, structures of blocks of data and messages, as well as data models;
- rules for implementation of the coding standards.

The common UIC/OSJD leaflets carry mandatory status for members of both organisations. Any exemption from this provision shall be specified in the leaflet in question.

**1.4** - This leaflet supplements and draws on the provisions of the Internal Regulations of the Joint UIC/OSJD Group for Coding and Information Technology.

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## 2 - Definition

### 2.1 - Coding

A process whereby a relationship is established between the items on a list and the codes used to represent each of these items. Each item on the list corresponds to one code only. A code must be used to describe unambiguously one item in the list only.

For example, the items of a list can be names of railway companies, station names or types of wagon brakes.

### 2.2 - Decoding

The reconversion of a code to the item's name in ordinary language.

### 2.3 - Code

One character or set of characters, which represent an item on the list. For example, a code may be formed of digits, letters or special signs.

### 2.4 - Code list

Complete list of items together with their associated codes.

## 3 - General characteristics of coding

3.1 - Information coding has the following main objectives:

- to condense the information,
- to ensure uniform presentation,
- to eliminate ambiguities resulting from homonyms and synonyms,
- to facilitate sorting and identification.

3.2 - A coding must:

- identify uniquely, simply and reliably each item in the list to which it refers; the code chosen thus enables the item to be uniquely and unambiguously identified by the symbol it represents;
- enable the coded objects to be identified and allow functions such as search, sorting, grouping and other operations with the data elements.

3.3 - A coding must also meet the following general requirements:

- Permanence:** the code allocated must remain unchanged for as long as possible;
- Simplicity:** the code must take account of the conditions under which it is to be used, and the qualification of the staff using it;
- Accuracy:** there must be no ambiguity when allocating a code to an item;
- Conciseness:** the minimum number of symbols must be used taking into account the requirements expressed by all users;
- Enhancement:** a sufficient number of free codes has to be ensured to allow coding of new items without affecting the structure of the code;
- Effectiveness:** the code must be relevant to the application for which it was intended;
- Compatibility:** it must be possible for the code to be processed by computer.

## 4 - Characteristics of coding used by railway companies

**4.1** - Standardisation of coding is an absolute prerequisite to exchanges of information between railway companies, and is one aspect of information processing standardisation which the railway companies must endeavour to achieve.

**4.2** - Standard coding must be numerical, to avoid difficulties arising from the use of different alphabets. Another advantage of numerical coding is the possibility of checking the accuracy of the code by checking the number according to *UIC Leaflet 913* (see [Bibliography - page 10](#)).

Possible exceptions to the principle of numerical coding and to individual chapters (points) in this leaflet shall be allowed, provided the generally valid standards produced by international standards bodies are adopted.



## 5 - Coding principles and methods

**5.1** - Before establishing a new code list, it is necessary:

- to check whether the same coding has not already been established to meet other requirements;
- to know the estimated number of items to be coded in the list;
- to choose the system for allocating of codes to items on the list;
- to choose the principle and method for coding.

**5.2** - Depending on the aims of coding, there are non-structured and structured principles of coding of information.

**5.3** - The non-structured coding principle involves no classification of items and uses a sequenced coding principle i.e. a method of coding, when integer numbers are used for code values.

When the sequenced coding method is used, each item of the list is identified with a code, which merely serves for reference, without giving any indication of its characteristics.

Such a coding system is well suited to information processing in computers but, when large numbers of items are involved, its human processing is limited or even impossible.

**5.4** - The structured coding principle involves the classification of items according to defined characteristics and use of the following coding methods:

- serial-order method: integer numbers are used for code values and specific ranges are dedicated for coded items with the same characteristics;
- sequential method: items are coded based on their characteristics using the tree principle. The meaning of character(s) on each position of the code depends on the value (result of division) of the previous position;
- parallel method: the code is composed of several parts, where each part is coded independently and which together present one value of the list.

Structured coding allows staff to sort the objects according to separate coding characteristics. A structured code provides information on the peculiarities of the given item.

## 6 - Management of coding

**6.1** - The Joint UIC/OSJD Group for Coding and Information Technology is responsible for coordinating coding of information between members of UIC and/or OSJD.

**6.2** - The Internal Regulations of the Joint UIC/OSJD Group for Coding and Information Technology define the procedures for addressing and examining coding and preparation of corresponding common leaflets.

**6.3** - Once approved by the Joint UIC/OSJD Group for Coding and Information Technology, leaflet updates or new leaflets shall be published by both railway organisations.

**6.4** - Any exemptions to the above-mentioned procedures must be specified in the leaflet in question.

**6.5** - The list of common leaflets is given in Appendix **A - page 8**. This list can be modified by decision of the Joint UIC/OSJD Group for Coding and Information Technology.

## Appendix A - Leaflets for which management is coordinated by the Joint UIC/OSJD Group for Coding and Information Technology

419-1	Analytical numbering of international passenger trains
419-2	Analytical numbering of international freight trains
428-1	International sorting system for wagonload traffic (UIC only)
438-1	Identification marking for passenger rolling stock (OSJD: 582-1)
438-2	Identification marking for freight rolling stock (OSJD: 582-2)
438-3	Identification marking for tractive stock (OSJD: 582-3)
438-4	Identification marking for special vehicles (OSJD: 582-4)
912	Principles governing standard messages for data exchange at international level
912-2	Exchange of information between railways by means of magnetic tape
912-3	Directory of railway messages in the EDIFACT structure <sup>a</sup>
913	Self-checking of registration numbers
915	Structured (data model) representation of passenger traffic data
916-1	Implementation guide for Edifact messages in the passenger sector - timetable data exchange
917-5	Description of the HERMES system <sup>b</sup>
918-0	Electronic seat/berth reservation and electronic production of travel documents - General regulations <sup>b</sup>
918-1	Electronic seat/berth reservation and electronic production of travel documents - Exchange of messages <sup>b</sup>
918-2	Electronic seat/berth reservation and electronic production of travel documents - Transport documents (RCT2 Standard) <sup>b</sup>

a. With the note that the costs are shared between the OSJD and the UIC (balanced financing) and acknowledging that the contents and publication of the directory are defined outside the Joint Group.

b. With the note that amendments are decided and published directly by the relevant UIC working parties.

920	General principles governing the preparation and administration of coding
920-1	Standard Numerical Coding for Railway Undertakings and Infrastructure Managers
920-2	Standard numerical coding of locations
920-3	Standard coding of currencies
920-4	Standard coding of dates and periods
920-5	Standard numerical coding of routings for international goods traffic
920-6	Standard numerical coding of additional charges, customs duties and other charges
920-7	Standard numerical coding for instructions concerning methods of payment
920-8	Standard numerical coding of international freight tariffs
920-9	Standard numerical coding of international passenger routes
920-10	Standard numerical code for railway customers
920-11	Standard numerical coding of information concerning damage occurring abroad to the various parts of wagons
920-12	Standard numerical coding of damage to freight in international traffic
920-13	Standard numerical coding of general information required for international freight traffic
920-14	Standard numerical country coding for use in railway traffic
920-15	Standard numerical coding of unit loads and transport packaging

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## Bibliography

### 1. UIC leaflets

**International Union of Railways (UIC)**

*UIC Leaflet 913: Self-checking of registration numbers*, 1st edition of 1.1.64

### 2. Minutes of meetings

**International Union of Railways (UIC) / Organisation for the Collaboration between Railways (OSJD)**

*Joint UIC/OSJD Group for Coding and Information Technology*, Seville, September 1995

*Joint UIC/OSJD Group for Coding and Information Technology*, Brasov, May 2002

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