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A short paper on identifying rail vehicles

Introduction

This paper reviews current issues in the identification of rail vehicles. It takes account of the Luxembourg protocol on rail vehicles and the ERA work on setting up a single European vehicle file. It is deliberately over-simplified to reduce its length. The paper draws to some extent on the study on vehicle identification undertaken for the European Commission in 2003 by a consortium led by Colin Buchanan and Partners (the report may be downloaded from http://ec.europa.eu/transport/rail/studies/index_en.htm).

Background

European railways have a long-standing twelve digit numbering system for identifying vehicles. This system was devised by the UIC and OSJD in the 1960s and defined in the UIC 438 series of leaflets. The system is structured, so that individual parts of the number have a defined meaning and the system provides for a check digit to ensure a certain robustness. The structuring of the number is important because it allows the basic characteristics of a vehicle to be predicted from its number alone (for example, first class coach). Some railways use the numbering system within their computer systems (for example, to define the next use for a freight vehicle). At the time the system was first defined an important constraint was to be able to accept and process vehicles at frontiers without any opportunity to refer to the vehicle owners' data files.

The elements in the numbers were:

- Digits 1&2 operating constraints (e.g. not accepted on every infrastructure)
- Digits 3&4 home (this is very complex and is treated in the text below)
- Digits 5-8 vehicle type

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Digits 9-11 serial number within vehicle type
Digit 12 check digit.

The concept of “home” is a complex one. In every case this was a home railway, defined by a UIC railway code. However the field was used by a number of different organisations for quite different purposes. Primarily it indicated sponsorship and therefore the railway responsible for the vehicle or responsible for the relationship with the vehicle’s owner if it was privately owned. It also had an operating significance indicating the railway to which the vehicle was to be returned in the event of no other orders. It was also taken as indicating the railway responsible for defining or approving the maintenance regime. It was taken by customs organisations as the fiscal base of the vehicle for cabotage purposes. In the event of the vehicle being sold to a new country, the home number would normally change. In fact, with the exception of the first two digits, there were widespread exceptions and anomalies for all the others. Furthermore, and crucially, the system could not accommodate non UIC railways.

The Colin Buchanan study, the railway community itself and the Commission were clear that the system had to change to accommodate liberalisation. All three were clear that the twelve digit system was so deeply imbedded in railway software and hardware systems that it was necessary to keep some form of twelve digit system. The railway community and the Colin Buchanan study were likewise clear that it was desirable to retain a structured system (the alternative, an unstructured system such as that adopted in North America which allocates numbers randomly and relies on access to computer files to identify vehicle types, was regarded as less reliable, more expensive and not practical in the field).

Accordingly the system was restructured to provide for the first two digits to become an interoperability indicator and the third and fourth digits to become the state in which the vehicle was first accepted into traffic. The remainder of the meaning of the vehicle number remained the same.

The signature of the Luxembourg protocol on 23 February 2007 introduces a new factor. To assert their rights, security holders require a vehicle identifier which cannot change.

The requirements of the Luxembourg protocol were already evident at the time of the Colin Buchanan study and for that reason the study recommended the continuance of the structured system (as modified) to indicate vehicle characteristics and a new permanent vehicle identifier which would never change.

The issues

Continuance of the structured twelve digit system is an important and positive move but it is important to realise that even in the modified twelve digit system vehicle numbers will change as a function of changes in the vehicles themselves. A number of examples of changes can be provided:

- Changes to the interoperability regime caused for example by fitting a vehicle with bogies or wheel sets to allow it to run to Spain or Finland; changes to the interoperability regime caused by selling a vehicle for infrastructure maintenance use and its restriction to the national



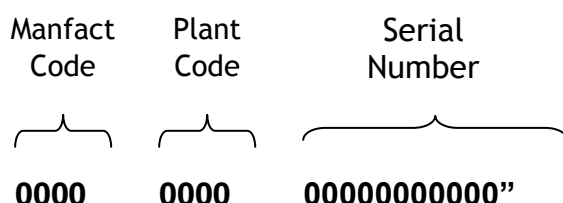
infrastructure; changes to a vehicle to make it compatible with all-state TSIs rather than just national standards.

- Changes to the vehicle type code by reason of comparatively small changes to the vehicle itself, fitting a flat with a debach'vite hood, changing coil carriers from shot gun to eye-to-sky, changing vehicle door configurations, etc.

All these changes are not only plausible, they have all occurred in practice. Similar factors apply to passenger vehicles (for example, if running speed is upgraded). The very merit of the structured system is that it allows for vehicle number changes to reflect changes in vehicles' characteristics.

This clearly makes the structured system incompatible with the requirements of the Luxembourg protocol. This not an argument for abandoning or modifying the structured twelve digit system but rather an argument for going back to the Colin Buchanan recommendation, that there should be a permanent identifier (VIN) in addition to the structured number. Colin Buchanan recommended the system below.

“It is important that the format of a VIN is different from that of running identifiers, to prevent the numbers being confused administratively. The need to accommodate existing vehicles dictates an eleven digit serial number (see below), in addition codes of at least four digits will be required for the manufacturer and plant code. The manufacturer and/or plant codes could consist of letters, however, since the Roman alphabet is not common across the geographic area of use, numeric coding is recommended. It is suggested a nineteen digit VIN be adopted which could be in the following form:



Recommendation

What is now essential therefore is to adopt this recommendation and provide for it in systems being developed by the ERA. This is a straight addition to the ERA specification (rather than a change) and in fact it allows the “ERA files” to be simpler because there would then be a unique vehicle and record identifier.

Chris Dugdale June 2007

(Chris was the technical manager of the Colin Buchanan study.)