

**WASTE PACKAGE SPECIFICATION AND
GUIDANCE DOCUMENTATION**

**WPS/410: Specification for Waste
Package Identification System**

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Bibliography

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**WASTE PACKAGE SPECIFICATION AND GUIDANCE DOCUMENTATION
SPECIFICATION FOR WASTE PACKAGE IDENTIFICATION SYSTEM**

This document forms part of a suite of documents prepared and issued by the Radioactive Waste Management Directorate (RWMD) of the Nuclear Decommissioning Authority (NDA).

The Waste Package Specification and Guidance Documentation (WPSGD) provide specifications and guidance for waste packages, containing Intermediate Level Waste and certain Low Level Wastes, which meet the transport and disposability requirements of geological disposal in the UK. They are based on, and are compatible with, the Generic Waste Package Specification (GWPS).

The WPSGD are intended to provide a 'user-level' interpretation of the GWPS to assist Site License Companies (SLCs) in the early development of plans and strategies for the management of radioactive wastes. To aid in the interpretation of the criteria defined by the WPSGD, and in their application to proposals for the packaging of wastes, SLCs are advised to contact RWMD at an early stage.

The WPSGD will be subject to periodic enhancement and revision. SLCs are therefore advised to contact RWMD to confirm that they are in possession of the latest version of any documentation used.

WPSGD DOCUMENT NUMBER WPS/410 - VERSION HISTORY

VERSION	DATE	COMMENTS
WPS/410/01	September 2005	Aligns with GWPS (Nirex Report N/104) as published June 2005
WPS/410/02	March 2008	Responsibility for the WPSGD passed to the NDA RWMD. Aligns with Issue 2 of GWPS (Nirex Report N/104) as published March 2007. Minor updating changes incorporated.

This document has been compiled on the basis of information obtained by Nirex and latterly by the NDA. The document was verified in accordance with arrangements established by the NDA that meet the requirements of ISO 9001. The document has been fully verified and approved for publication by the NDA.

1 INTRODUCTION

The Radioactive Waste Management Directorate (RWMD) of the Nuclear Decommissioning Authority (NDA) has been established with the remit to implement the geological disposal option for the UK's higher activity radioactive wastes. The NDA is currently working with Government and stakeholders through the *Managing Radioactive Waste Safely* (MRWS) consultation process to plan the development of a Geological Disposal Facility (GDF).

As the ultimate receiver of wastes, RWMD, acting as GDF implementer and future operator, has established waste packaging standards and defined package specifications to enable the industry to condition radioactive wastes in a form that will be compatible with future transport and disposal. In this respect RWMD is taking forward waste packaging standards and specifications which were originally developed by United Kingdom Nirex Ltd, which ceased trading on 1st April 2007 and whose work has been integrated into the NDA.

The primary document which defines the packaging standards and specifications for Intermediate Level Waste (ILW), and certain Low Level Wastes (LLW) not suitable for disposal in other LLW facilities is the Generic Waste Package Specification (GWPS) [1]. The GWPS is supported by the Waste Package Specification and Guidance Documentation (WPSGD) which comprises a suite of documentation primarily aimed at SLCs, its intention being to present the generic packaging standards and specifications at the user level. The WPSGD also includes explanatory material and guidance that users will find helpful when it comes to application of the specification to practical packaging projects. For further information on the extent and the role of the WPSGD, reference should be made to the *Introduction to the Waste Package Specification and Guidance Documentation, WPS/100*¹.

Every waste package destined for long-term management must be allocated a unique identifier which will be used to:

- allow the waste package to be identified during all the relevant stages of long-term management;
- enable a record of the location the waste package to be maintained throughout each stage of long-term management, and;
- provide an unambiguous and permanent link between the waste package and the source data and information.

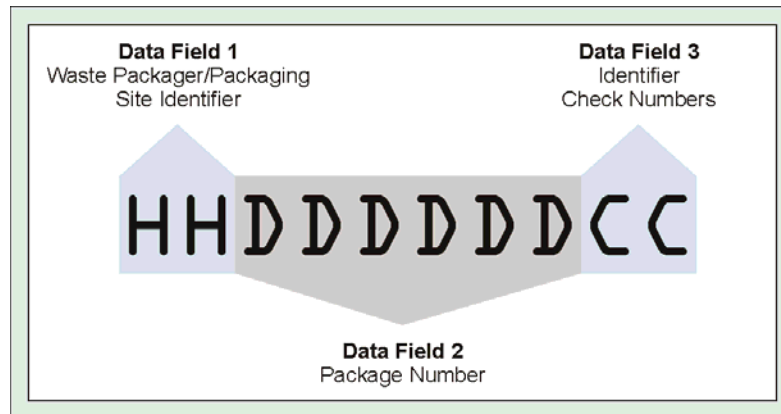
This Specification covers the format and structure of the waste package identifier, the allocation of identifiers by RWMD and their use by SLCs. It is supported by *Waste Package Identification System: Explanatory Material and Guidance, WPS/860*, which contains details of the basis of the identification requirements, together with an example of the method used to confirm the validity of each unique identifier.

2 IDENTIFIER SYSTEM AND FORMAT

The identifier shall consist of ten alpha-numeric characters arranged in a horizontal sequence from left to right with no intermediate spaces or other markings, as shown in Figure 1.

¹ Specific references to individual documents within the WPSGD are made in this document in *italic script*, followed by the relevant WPS number.

Figure 1 Format of Waste Package Identifier



The characters will be of the OCR-A (Optical Character Recognition) form, as specified by BS 5464: Part 1 [2]. The alphabetic characters shall be restricted to those used in the hexadecimal numbering system, i.e. A, B, C, D, E, F.

The identifier will comprise three data fields which are contained within a ten alphanumeric character sequence. The three data fields shall be identified as Data Field 1, Data Field 2 and Data Field 3 and shall be specified as follows:

2.1 Data Field 1:

Data Field 1 identifies the original source of the waste package (i.e. the waste packaging site or plant).

Data Field 1 shall consist of two sequential hexadecimal characters (HH) each of which shall be one of the following:

0 1 2 3 4 5 6 7 8 9 A B C D E F

2.2 Data Field 2:

Data Field 2 identifies the package number from a particular waste packaging site or plant.

Data Field 2 shall consist of six sequential decimal characters (DDDDDD) each of which shall be one of the following:

0 1 2 3 4 5 6 7 8 9

2.3 Data Field 3:

Data Field 3 is a check number which is derived mathematically from Data Field 1 and Data Field 2.

Data Field 3 shall consist of a two sequential decimal characters (CC) each of which shall be one of the following:

0 1 2 3 4 5 6 7 8 9

3 CHECK NUMBER SYSTEM

The check number for an identifier shall be derived by the following algorithm:

$$CC = 97 - R \text{ where } R = \{ (HHDDDDDD) \times 100 \} \bmod 97$$

Where HHDDDDDD is a real number and 'mod' represents the modulo function $n \bmod m$ which gives the remainder when n is divided by m.

The check number shall always consist of two digits and shall be prefaced by zero if the result of applying the algorithm is less than ten.

Each value of H is to be converted to its decimal equivalent and is to consist of two digits using zeros, where necessary, to result in a four digit decimal equivalent for Data Field 1.

When a computer program is used to generate check numbers, the waste packager shall ensure that these are correct by the use of validated software only.

4 MARKING OF IDENTIFIERS ON WASTE PACKAGES

Every waste package shall be marked with an identifier of the size and in the locations as specified in the waste package specification appropriate to the waste package (i.e. the relevant WPSGD Series 300 document for the waste package).

4.1 Allocation of Data Field 1 Identifiers

Data Field 1 identifiers will be allocated by RWMD, which shall be deemed to hold the definitive record of identifier allocation.

4.2 Allocation of Data Field 2 Identifiers

It is the responsibility of the waste packager to allocate Data Field 2 identifiers to waste packages.

The waste packager should sub-allocate the Data Field 2 identifiers issued to a site, in blocks to differentiate between waste package types and, where possible, waste streams.

The waste packager shall ensure that each sub-allocated block of package numbers are used only for the intended waste package types and/or waste streams.

For each Data Field 1 identifier with a waste package number sequence from 000000 to 999999, the number 000000 shall not be used as a package number.

5 QUALITY MANAGEMENT

The allocation and use of waste package identifiers shall be subject to the requirements of *Waste Package Quality Management Specification, WPS/200*.

6 REFERENCES

- 1 Nirex, *Generic Waste Package Specification*, Nirex Report N/104 Issue 2, 2007.
- 2 British Standards Institution, Character Set OCR-A, Shapes and Dimensions of the Printed Image, BS 5464: Part 1: 1977 (1984).

