# Recommendations to water-related database designers aiming at bibliographic database design and creation based on the Micro CDS/ISIS and the CCF

Edited by:

M. Šićević

The "Jaroslav Cerni" Institute for the
Development of Water Resources, Belgrade, Yugoslavia

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# PREFACE

Although the total amount of water on earth is generally assumed to have remained virtually constant, the rapid growth of population, together with the extension of irrigated agriculture and industrial development, are stressing the quantity and quality aspects of the natural system. Because of the increasing problems, man has begun to realize that he can no longer follow a 'use and discard' philosophy - either with water resources or any other natural resource. As a result, the need for a consistent policy of rational management of water resources has become evident.

Rational water management, however, should be founded upon a thorough understanding of water availability and movement. Thus, as a contribution to the solution of the world's water problems, UNESCO, in 1965, began the first world-wide programme of studies of the hydrological cycle - the International Hydrological Decade (IHD). The research programme was complemented by a major effort in the field of hydrological education and training. The activities undertaken during the Decade proved to be of great interest and value to Member States. By the end of that period, a majority of UNESCO's Member States had formed IHD National Committees to carry out relevant national activities and to participate in regional and international co-operation within the IHD programme. The knowledge of the world's water resources had substantially improved. Hydrology became widely recognized as an independent professional option and facilities for the training of hydrologists had been developed.

Conscious of the need to expand upon the efforts initiated during the International Hydrological Decade and following the recommendation of Member States, UNESCO, in 1975, launched a new long term intergovernmental programme, the International Hydrological Programme (IHP), to follow the Decade.

Although the IHP is basically a scientific and educational programme, UNESCO has been aware from the beginning of a need to direct its activities towards the practical solutions of the world's very real water resources problems. Accordingly, and in line with the recommendations of the 1977 United Nations Water Conference, the objectives of the International Hydrological Programme have been gradually expanded in order to cover not only hydrological processes considered in inter-relationship with the environment and human activities, but also the scientific aspects of multi-purpose utilization and conservation of water resources to meet the needs of economic and social development. Thus, while maintaining IHP's scientific concept, the objectives have shifted

perceptibly towards a multidisciplinary approach to the assessment, planning, and rational management of water resources.

As part of UNESCO's contribution to the objectives of the IHP, two publication series are issued: 'Studies and Reports in Hydrology' and 'Technical Papers in Hydrology'. In addition to these publications, and in order to expedite exchange of information in the areas in which it is most needed, works of a preliminary nature are issued in the form of Technical Documents.

# 1. SUMMARY

These Recommendations are intended to help the database designers who are confronted with the problem of designing a bibliographic database using the micro CDS/ISIS software and the international standard exchange format, Common Communication Format (CCF).

Therefore the Recommendations include:

a) methodological aspects of a bibliographic database design, including the aspects pertaining to the possibility of an international exchange of information;

b) a very concise survey of the most prominent features of the CDS/ISIS software;

c) a survey of the features of the standard exchange format CCF;

d) an assessment of the correspondence of the CDS/ISIS software to the CCF;

e) the design of a model database based on data elements defined by the CCF and on the micro CDS/ISIS as the software tool.


# 2. INTRODUCTION

## 2.1 Background

UNESCO/IHP back to its Phase II (1980-1984) pays attention to scientific and technical documentary information. As a result, a certain number of activities were realized and some documents were produced[1,2].

In 1990 we have entered the Phase IV of UNESCO/IHP (1990-1995), which has as a general theme:
'Hydrology and water resources for sustainable development in a changing environment'.
The activities on water-related documentary information systems are set again in an official framework outlined as follows:

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[1,2] Remark:    Within the text of this document bibliographic references are given in brief form. Accompanying reference numbers refer to the complete citation, which is in the list of references at the end of this document.

**Sub-programme M:**

*Management of water resources for sustainable development.*

**Theme M-2:**
Scientific and technical water-related information and documentation systems.

**Project M-2-1:**
Development of national water-related information and documentation systems, with emphasis on non-numerical information

**Project M-2-2:**
The use of internationally available water-related information systems

These Recommendations are, first of all, conceived so as to facilitate the running of the above-said Project M-2-1 whose contents includes the design and development of non-numerical databases.

Within the previous phase of the UNESCO/IHP, i.e. within Phase III, the suitability of UNESCO software for storage and retrieval of text information, named Micro CDS/ISIS, was evaluated and positively assessed[3] in several institutions including those active in UNESCO/IHP activities concerning water-related documentary information[*]. In addition, the software can be obtained free of charge from the UNESCO/PGI. It is for these reasons that the members of the Working Group for the Theme M-2 recommend the use of this software to those Member States who are about to start the activities under the scope of the Project M-2-1. Of course, these recommendations are not limited to the water-related community since the software CDS/ISIS is applicable to the design and creation of databases consisting of any text information with no respect to the meaning of information contents.

The author of these Recommendations was actively involved in the UNESCO/UNDP Regional project INTERNET[**] aimed at establishing a network of cooperating institutions ready to establish and exchange various forms of computerized scientific and technical information.

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[*]    - The University Library of the Vrije Universiteit Brussel in Brussels, Belgium.
       - The 'Jaroslav Černi' Institute for the Development of Water Resources in Belgrade, Yugoslavia.

[**]    Scientific and technical information network (INTERNET),
        Project no.: UNDP/UNESCO RER/87/20

Since the micro CDS/ISIS software has been adopted for the creation of non-numerical data bases within the INTERNET too, the results and findings acquired through that regional project are now being used to serve the needs of the project M-2-1.

## 2.2 Purpose

These Recommendations are meant to offer a practical approach to those confronted with the task of designing a database using the Micro CDS/ISIS software. In addition, since the final goal of the Project M-2-1 is to enable a lively (active) exchange of information between interested institutions, the Recommendations also have to point out the problems related to information exchange as well as to indicate some of possible solutions.

# 3. METHODOLOGICAL ASPECTS OF A BIBLIOGRAPHIC DATABASE DESIGN

## 3.1 Database structure

The main function that a bibliographic database in a particular subject field must secure is to inform end-users about the existence of relevant documents, i.e. to offer them information in the form of the so-called bibliographic reference. This actually means that a bibliographic database consists of records representing bibliographic references.

### 3.1.1 Data elements

A record pertaining to a bibliographic reference consists essentially of:

- data elements* aimed at the formal identification of a particular document**, which are taken from the original document;

-- data elements pertaining to the identification of the subject contents of the document, which are chosen according to an appropriate classification system and/or according to an adopted terminology control tool;

- concise abstract.

The most important aspect of a database design is to organize and store its data elements in such a way that we are able to find, select and extract them in the process of the information retrieval. The question which emerges from the previous statement is: which data elements are to be stored? The answer to this question is crucial in any database design. Namely, the choice of data elements at a design stage will determine the quality of the retrieval results***.

Items normally eligible to be selected as data elements would be those that must be able to be processed individually.

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* Data elements are elementary pieces of information which can be identified and accessed individually

** Document means 'any published or unpublished item which is to be described in a bibliographic record' (Definition taken from UNISIST Reference Manual).

*** Retrieval results here refer to the quality of the retrieved database element and not to the quality of a retrieval process itself.

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Data elements may be stored in **fields** and **subfields**. The fields broken into subfields are particularly useful for keeping different data elements that refer to one entity.

In those cases where a given data element may occur more than once in a given record, it may be stored in a so-called **repeatable field**. A typical example for such a situation is the author field. But, within a repeatable field one cannot have access to the particular occurrence of a data element individually. A repeatable field may also contain subfields, which enables the handling of 2-dimensional data (one dimension being the fields, and the other the subfields.).

### 3.1.2 Retrievable data elements

Databases are created to store data and to enable a retrieval process when the need arises.

Records can be retrieved from databases through fields and/or subfields (i.e. through data elements they contain) which were made retrievable at the database design stage. For instance, in the retrieval of bibliographic records it may be desirable to access a record by author, by subject, or by any other data element occurring in the record.

One of the techniques for making fields and/or subfields retrievable is the so-called 'inversion'. Thus, very often retrievable elements are called **inverted** elements. In fact, the inversion consists of taking the specified elements out from records and storing them into a special file called 'inverted file'.

### 3.1.3 Terminological control

Data elements used to identify the subject contents of a document are known as **subject terms** or **keywords**. Special problems are encountered when making keywords retrievable. Namely, the very richness of the subject terms used within a natural language causes problems in the retrieval. For instance, the concept of a place where ships can reach the shore or be sheltered, can be expressed in various ways: _port, ports, harbor, harbors, harbour, harbours._

To overcome these problems, a control of subject terms is required. Such a control is known as "**terminological control**". A database using an uncontrolled set of subject terms requires **terminological control in retrieval**. It is done through the expansion of a query term. Namely, a

query term is replaced by a Boolean 'OR' combination of the query term itself with any morphological and spelling variants as well as synonyms. If applied to the previous example it gives:

_port_ **OR** _ports_ **OR** _harbor_ **OR** _harbors_ **OR** _harbour_ **OR** _harbours_

Another solution to the problem is **terminological control in indexing.** It consists of using a controlled vocabulary in the process of data entry. A controlled vocabulary consists of terms and/or their variants that are agreed upon to serve for the identification of appropriate concepts within a given database. Such terms are called **subject descriptors.** They enable that indexers as well as searchers always use the same concerted term for a given concept.

Homonyms present another problem. For example:

_port_ in the sense of _harbour_
_port_ in the sense of _telecommunication port._

In order to avoid such ambiguities a controlled vocabulary has to contain a prescribed term for each meaning of a homonym.

The problem of terminological control can be further elaborated leading to the notion of **thesaurus**, being a special, controlled vocabulary taking into account also the relationships that exist between concepts. But, obviously, any further elaboration goes out of the scope of this document. Those interested in the topic may study 'Organizing Information'[12], Chapters 12-15.

### 3.1.3.1 Terminological control in the water area

Now, the question which emerges is which terminological control tool in indexing should be used within a water field. A general recommendation cannot be given since the choice will depend on the range of water disciplines the system is intended to cover. The information system designer should foresee this tool (controlled vocabulary, thesaurus, classification scheme, etc.) and either adopt* it or develop it.

### 3.1.4 Bibliographic levels

A bibliographic reference is represented at one or several bibliographic levels. The basic (the lowest) bibliographic level contains the data elements (grouped in fields) describing a target bibliographic item (e.g. journal article, conference paper etc.). Further, a higher bibliographic level

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\* **adopt** in the sense of taking over an already existing set of subject terms (list of existing thesauri in English is given in Appendix 1)

contains data elements needed for the identification of a physical unit encompassing the target item (respectively to the above: journal, conference proceedings, etc.), this being aimed at ordering the particular document from the supplier (library, documentation centre, official distributor).

## 3.2 International exchange

Specific aspects are encountered when designing the database conceived so as to enable an international exchange of data. These are : bilingual character of the database and adoption of a common exchange format.

### 3.2.1 Multilingual character of the database

When designing a database which is to be offered for exchange beyond national borders the question of language arises. This is particularly relevant for countries where the home language is not a world language. In such cases, the home (native) language of the institution providing information is to be considered 'the language of record', while it has to be decided upon the language which should support an international communication (e.g.English, French, Spanish). So, it turns out that such a database has to be at least a bilingual one. If partners in information exchange contribute to a common database, or if they merge external data with their own data aiming at producing some mixed outputs, then they should either agree to use a common language to enter elements such as place names or names of countries, or they should agree to follow special guidelines (see IDIN Manual[8], page 11)

### 3.2.2 Adoption of a common exchange format

Exchange formats have been developed in order to make it possible to transfer data between different systems (databases). If, when exchanging information, we want to eliminate the need to make conversions between internal formats of each and every pair of systems (databases), we can simply adopt a common format to which (when exporting data) and from which (when importing data) we will make conversions. This is how the idea of creating standard exchange formats was born. Namely, a standard exchange format means the format adopted on a wider level (national, regional, international) to serve exchange purposes within a larger community of users. The best known international standard exchange formats are UNIMARC, within the community of national libraries, and UNISIST Reference Manual, within the community of abstracting and indexing services. Unfortunately, both of these formats were designed to cater for the needs of the specific parts of information community. In order to avoid the fragmentation of the information community into

separate groups, which was caused through the introduction of different standards for the same type of information (in this case bibliographic information), a new international standard was created : the Common Communication Format (CCF). It was done by a group of eminent experts under the auspices of UNESCO (within the framework of the General Information Programme). So, CCF is aimed at bridging the differences in transferring bibliographic information among computer-based systems, large and small, worldwide.

In the context of the above-said we strongly recommend to the water-related community the adoption of the CCF for exchange purposes. To this end two documents have to be consulted [5,6].

# 4. SOFTWARE SUPPORT BY MICRO CDS/ISIS

The data entry, processing and retrieval within a bibliographic database is an example of the management of structured text information. It is a specific application of a database management system (DBMS), in the literature known as information retrieval system, which makes certain demands on the software used. Nowadays there is a number of software packages specifically designed for bibliographic database management. The place which belongs to the software package CDS/ISIS among them is rather high. In addition, it can be obtained from UNESCO free of charge. This is why it can boast of many thousands of users all over the world now.

## 4.1 Availability

The CDS/ISIS (mainframe version) was originally conceived and developed as a system for the internal use within the UNESCO Secretariat. Its micro version aroused a considerable and growing interest in those institutions in the Member States, especially developing countries, which were about to start the computerization of their information and documentation activities, but did not have the resources to either develop their own software or to acquire commercially available packages. In response to that need UNESCO took over the task to further develop the system and to disseminate it to other international organizations and institutions in the Member States, upon request.

The name of the software is a combination of the 'Computerized Documentation System' (CDS) and the 'Integrated Set of Information Systems' (ISIS). The package is developed within the UNESCO General Information Programme (PGI). In 1989 the release 2.3 was produced and described in the manual[4], which serves as an excellent documentation support. In 1991, the version 3.0 with additional possibilities was issued.

## 4.2 Hardware requirements

The minimum hardware requirements for running CDS/ISIS are the following: IBM-PC/XT/AT or compatible equipment with 640 Kbytes RAM memory, floppy disk unit, hard disk, monitor (monochrome or colour) and printer.

The special versions are available for WANG-PC's under MS-DOS and for VAX machines under VAX/VMS.

## 4.3 System functions

CDS/ISIS allows us to:

- Define a database;
- Enter new records and update existing ones;
- Retrieve records by their contents;
- Display records or portions thereof;
- Sort records in any sequence desired;
- Print retrieved records or whole catalogues;
- Import and export data in ISO 2709 format;
- Develop additional applications using CDS/ISIS
  programming facility.

## 4.4 Features of CDS/ISIS database

A database created using CDS/ISIS consists of a number of logically related but physically distinct computer files:

### 4.4.1 Database definition files:

a) *Field Definition Table (FDT)*, which defines the fields which may be present in the database. Its appearance for a model database is given in Appendix 2.

b) *Data entry worksheet*, which is an electronic version of the data entry paper form and which is used to create and/or update records. A data entry worksheet consists of fields defined in the FDT. For all such fields a number of parameters must be provided during the worksheet creation, such as: tag number, position of field name, position of field value, field attribute, field length, field type, field pattern, help message, and default value. For a given database we may create as many data entry worksheets as we like. A possible outlook of the Data entry paper form for a model database is given in Appendix 3. Here, the ordering of fields in the physical sense is irrelevant, and is chosen as given to follow a possible logical arrangement.

c) *Display/print format*, which is a set of codes enabling us to either display or print the contents of a record in a desired way. Display/print formats are created by means of the CDS/ISIS Formatting Language. For a given database we may create as many display/print formats as needed. Two display/print formats have been created for the model database: the default format to present the English part of a record, and a similar format to present the part of a record which pertains to the home language. (Appendix 4).

d) *Field Select Table (FST),* which defines the rapidly searchable fields and the way in which data elements from these fields are included in the inverted file. This inclusion enables retrieval by various access points (i.e. by various data elements).
An FST consists of one or more entries (one entry making one line), depending on how many data elements we want to include. The FST for the model database is given in Appendix 5.

## 4.4.2 Master File

The Master File contains all the records in their full form (i.e.containing all fields). Each record is identified by a unique number automatically assigned by CDS/ISIS when the record is created, called Master File Number (MFN). A record sample of the model database printed using the display/print format created for the model database is shown in Appendix 6.

## 4.4.3 Inverted File

The access to Master File record can be either through MFN or through some other access points (e.g. author, subject, publishing year and/or any other data element occurring in the record). The access through different access points is made possible by the creation of Inverted File. It contains, in fact, all data elements which were defined as access points within a given database. In addition, for each data element, a list of Master File records from which the data element has been extracted is attached. Thus, we may think of the Inverted File as an index to the contents of the Master File.

The choice of data elements to serve as access point is a part of the design procedure. The access points are defined in Field Select Table (FST). From the FST given in Appendix 5 it can be seen that the access points for the model database are: author, subject descriptors (both in English and in home language), geographic descriptors (both in English and in home language), title of journal article, monograph title, language of item, and publication year.

# 5. FEATURES OF THE CCF

As stated in the preface of the CCF basic document[5] the purpose of the CCF is to provide a detailed and structured method for recording a number of mandatory and optional data elements in a computer-readable bibliographic record for exchange purposes between two or more computer-based systems. The data elements of the format will also be useful for a single bibliographic agency which wishes to build its own format while remaining compatible with the CCF.

## 5.1 Structure of the CCF

The CCF consists of two main components:

1. Rules for the arrangement of data to be exchanged on a computer medium;
2. Codes to identify the different data elements in the record.

Regarding the first one, there exists a standard format for the exchange of bibliographic data on magnetic tape, established by the International Organization for Standardization, ISO 2709[7]. The record structure of the CCF corresponds to a specific implementation of the international standard ISO 2709-1981 (see the CCF basic document[5], page 17).
The second component consists of specific field identifiers (**tags**), **subfield identifiers** and **indicators**. There is no universally-accepted standard for these. In addition, the CCF includes **segment identifiers**, which other systems do not use (see the CCF basic document[5], page 17).

## 5.2 Features of CCF relevant for the choice of data elements

The CCF divides data into a number of categories called data elements. The CCF has about 50 data elements, many of which are divided into sub-elements. Many systems have been developed which do not have such subtle distinctions of data elements as the CCF has. Although such systems can function very well as isolated, stand-alone systems, it may prove difficult to incorporate the data they produce into other systems. Since the CCF has been devised as a result of an enormous experience, it may be expected that the distinctions available in the CCF would once be required in other systems too (depending on how quick a particular database staff would be able to become aware of its advantages).
If these distinctions are there from the very start, it will be possible, on one hand to secure a good quality database and, on the other, to facilitate the use of the CCF as the exchange format. Therefore, we recommend that the data elements used in the CCF be also used as elements on which the

internal format of the database would be based. As a matter of fact, in the CCF basic document[5] on page 11 it is said too that the CCF is meant, beside other purposes, 'to serve as the basis of the internal format for an agency's own bibliographic database'.


## 5.3 Cataloguing rules

There exist some rules prescribed for bibliographic description of items. A set of such rules is the International Standard Bibliographic Description (ISBD), which is a 'de facto' standard followed by many bibliographic agencies. It prescribes <u>content</u>, <u>form</u> and <u>punctuation</u> which are to be taken into account when creating a bibliographic record in the format to be inspected by a user. <u>The content</u> pertains to a set of data elements which should be present in the record when available on an item. <u>The form</u> usually means the entering of data in the form in which they are found on an item. <u>The punctuation</u> is prescribed to facilitate the identification by a user of each separate data element in the record.

As for the CCF it can be said that the content of the ISBD has been taken into account by including in the CCF those ISBD data elements which are necessary for the description of books and serials (such as ISBN and ISSN). The form of the ISBD has been taken into account by employing an indicator to show that the form of a data element is as on the item, as prescribed by the ISBD. Generally, no prescription is made in the CCF for punctuation since the appropriate punctuation can always be added when creating display formats. But, with the exception of the mentioned cases, the CCF avoids assuming any cataloguing rules in its data elements definitions. The main reason for that lies in the fact that the CCF is intended to enable institutions from different sectors of the information community to exchange records whether or not they use the same cataloguing rules.

However, for those ones wishing to apply the Anglo-American Cataloguing Rules (AACR) in conjunction with the CCF, there exists the manual entitled: 'Using the CCF : a manual for cataloguers using AACR'. In addition, the IDIN Manual[8] implements both the CCF and AACR.

It should be pointed out that the systems which use the same cataloguing rules will be able to exchange data more easily and with higher quality. Namely, when converted into a common exchange format (e.g. the CCF) their records will prove to be compatible (i.e. appropriate fields will have appropriate contents). However, for the systems not using the same or similar cataloguing rules the only solution is that each system finds the appropriate field in the common format for its own data elements. The recipient institution will then either have to accept what it finds there or to put an additional effort to transform some of the data elements so that they conform to its rules.

## 5.4 Record segments

The CCF permits a single bibliographic record to contain descriptions of more than one item, each item corresponding to a particular bibliographic level. To this end a concept of record segments has been introduced. Namely, the item for which the record is primarily created is known as **the target item**; it corresponds to the lowest bibliographic level and occupies **the primary segment** (having '0' as a sign). Other bibliographic items correspond to higher bibliographic levels and occupy **the secondary segments**. The relationships among the bibliographic items are shown through **the segment links** (see the CCF basic document[5], page 22).

## 5.5 Correspondence of CDS/ISIS to the CCF

Since CDS/ISIS supports the processing of variable length fields, it is convenient for the CCF which is a variable length format too.

Another convenience could lie in the fact that the CDS/ISIS exports data in the ISO 2709 format which is also the requirement imposed by the CCF. But, unluckily, the CDS/ISIS applies the version of ISO 2709 from 1973, while the CCF needs the version from 1981 which can cater for record segments. This problem will remain open till a further development of the CDS/ISIS in that sense occurs (see 'Implementation Notes for Users of CCF'[6], page 14).
However, it is possible to overcome this problem even now by preparing the record in such a way so as to enable a later creation of the record segments. To that end we have to create a field which would contain bibliographic levels. In addition, an instruction would be needed explaining how the segments could be created from the information obtained from that field.

Another appropriateness is the ability of both CDS/ISIS and the CCF to store data elements in subfields and repeatable fields.

## 5.6 Using CCF as an exchange format

A record in a database consists of data elements which are arranged in a particular structure i.e. in the so-called internal format. When exchanging information by using a standard exchange format we have to convert records from the internal format into that standard exchange format. If we apply the CCF as the standard, the procedure is the following:

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First, we have to prepare a table of equivalents between the data elements as stored in the system (referred to as 'the source format') and the data elements in the CCF (such a table is given for the model database in Appendix 7). It is necessary for the source format to be capable of the same depth of analysis as the CCF (see 'Implementation Notes for Users of CCF'[6], page 8). By no means this condition will be fulfilled in all the systems which have adopted CCF data elements for their own internal formats. Such systems do not requirethe conversion to be done. By using the export facility of CDS/ISIS, data will be exported for exchange in ISO format (ISO version of 1973).

For a system whose internal (source) format differs from the CCF, a table of of equivalents should be drawn up in two columns with data elements in the source format on the left side and the equivalent CCF identifiers (segment identifiers, tags, subfield identifiers, indicators) on the right side. According to that table a reformatting FST* should be created (see Mini-micro CDS/ISIS Reference Manual[4], p.190) and supplied in the CDS/ISIS export worksheet where requested (see Mini-micro CDS/ISIS Reference Manual[4], pp. 188-190).

## 5.7 Steps for a database creation

It may be useful to indicate here what are the steps to be undertaken in order to set up a particular database structure using CDS/ISIS software. (see Mini-micro CDS/ISIS Reference Manual[4], pp. 161-170).

1. By choosing ISISDEF services from the main CDS/ISIS menu, option C, we start creating the FDT. (see Mini-micro CDS/ISIS Reference Manual[4], pp. 31-39). The FDT provides information on the contents of the master records in a given database. In particular it defines the various fields which may be present and a number of parameters for each field.

2. Once created, the FDT is used to control the creation of data entry worksheets for the database. CDS/ISIS enables a smooth shift to the data entry worksheet creation immediately after the FDT creation. Data entry worksheets are created using the CDS/ISIS Worksheet Editor (see Mini-micro CDS/ISIS Reference Manual[4], pp. 207-213).

3. Now comes the phase of creating display/print format(s) using the commands of the Formatting Language (see Mini-micro CDS/ISIS Reference Manual[4], pp. 41-74).

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\*     A reformatting FST is used to reformat records during an import and/or export operation. It defines criteria for extracting data elements from a master file record in the wishful way for import/export.

4. Once we have defined data entry worksheet(s) in step 2, we are able to enter data in the database. Data entry is done by means of the Field Editor which is the basic tool for data entry and editing (see Mini-micro Reference Manual[4], pp. 199-202).

5. In order to be able to invert data elements which will serve as searchable fields, we have to create the Inverted file FST (see Mini-micro CDS/ISIS Reference Manual[4], pp. 75-85). It will have the same name as the database. FST is created by means of the Line Editor (see Mini-micro CDS/ISIS Reference Manual[4], pp. 203-205).

## 6. DESIGN OF A MODEL BIBLIOGRAPHIC DATABASE

The model database structure proposed herewith should not be considered as a fixed structure one has to stick to. It is no more than an example which can give an idea to database designers when customizing CDS/ISIS and CCF to their own needs.

### 6.1 Choice of data elements

As already said, although the CCF was intended primarily as an exchange format, it can also be used as the basis for the bibliographic database internal format.

There are two main advantages in doing so. First, the CCF basic document[5] elaborates exhaustively and in detail the bibliographic data elements which one will have to adopt when designing a database. Second, anyone basing a database internal format on a standard exchange format will find it easier to exchange data in the future if opportunity arises. This will be particularly so if one uses the CCF being the standard exchange format internationally adopted, and covering both sectors of the information community.

This is why the internal structure of the model database offered here is based on the data elements as prescribed by the CCF. This actually means that the fields and subfields of the model database have the same field tags and subfield identifiers as the corresponding CCF fields and/or subfields. Of course, only the most relevant data elements (according to the author's judgement) have been included.

Furthermore, the model database contains some fields which do not exist in the CCF, such as : 002, 003, 013, 014, 070, 320 - subfield 1, 500 - subfield 1, 601, 622, 625, 626, 710, 711, 712, 713, 714, 715, 716, 720, 730, 740, 741, 742.

For the newly introduced fields it was not possible to follow the recommendations for the format extension given in the CCF basic document[5], page 39, due to the limitations imposed by the CDS/ISIS which does not permit the use of alphabetic field tags. On the other hand, the newly introduced subfields could be denoted by numbers, as recommended in the CCF basic document[5].

There were several reasons for the above-cited extensions of the CCF. Namely, some of the fields were introduced in order to include some data elements that were judged useful (013, 014, 622), some of them in order to meet the requirements imposed by the bilingual character of the model database (002, 003, 320-1, 500-1, 601-A, 625, 626), and the fields from the range 710-742 were introduced in order to create the second bibliographic level, which corresponds to the CCF secondary segment.

The chosen data elements can successfully cater for the following document types:

- monograph
- journal article
- conference paper (published either within a monograph or within the special issue of a journal).

## 6.2 Retrievable fields

The following fields were made retrievable (searchable) in a fast way by indexing:

300-Personal author(s),
720-Personal authors, 2nd level,
440-Date of publication,
715-Date of publication, 2nd level,
620-Subject descriptor (in language of record),
625-Subject descriptor (in English),
622-Geographic descriptor (in language of record),
626-Geographic descriptor (in English).

This actually means that the contents of these fields were copied out from the records in accordance with the data extracting formats of the Field Select Table (FST), and then inverted according to the CDS/ISIS inversion techniques. From the FST (Appendix 5) it can be seen that the techniques applied were 0 and 4 (where 0 indicates that a whole field will be inverted, i.e. the first 30 characters of a field, and 4 indicates that each word of a field will be inverted).

Of course, it is always possible to make some additional data elements retrievable (either temporarily or permanently). To that end one has nothing but to modify the FST given in Appendix 5.

## 6.3 Fields used for subject retrieval

The fields reserved for subject retrieval are the following:

610-Classification scheme notation
620-Subject descriptor (in language of record),
625-Subject descriptor (in English),
622-Geographic descriptor (in language of record),
626-Geographic descriptor (in English),

The fields 622 and 626 (which do not exist in the CCF) were introduced aiming at indexing geographic concepts, which is of relevance in many water disciplines. The existence of these fields allows the creation of geographic indexes.

## 6.4 Bibliographic levels

A bibliographic reference in the model database is represented at one or two bibliographic levels. The first (the lower) bibliographic level contains the data elements describing a target bibliographic item: monograph, journal article, conference paper.

The second (the higher) bibliographic level contains data elements needed for the identification of a physical unit which encompasses the target item: journal, monograph containing conference papers, journal containing conference papers. A special field, field 070* (consisting of subfields A and B) has been introduced for storing information on bibliographic levels. Possible combinations of the contents for the subfields A (1st level) and B (2nd level) are:

| | | |
|---|---|---|
| I | for a monograph<br>being a target item | 070A: M (monograph)<br>070B: empty |
| IIa | for an article<br>published in a journal | 070A: A (analytic)<br>070B: S (serial) |
| IIb | for a conference paper<br>published in a journal | 070A: A (analytic)<br>070B: S (serial) |
| III | for a conference paper<br>published in a monograph | 070A: A (analytic)<br>070B: M (monograph). |

## 6.5 Record segments

If the item being described in the database is a part of a larger item, the description of the parent item is entered in the 'second bibliographic level'. In the CCF the first bibliographic level (which contains the target item) occupies the primary segment, while the second bibliographic level (which contains the parent item) occupies the secondary segment. But, due to the limitations of the CDS/ISIS explained previously (page 12), the above-said record segmentation is not yet possible within the CDS/ISIS. Therefore, a solution has been found such as to permit the creation of record segments at a later stage. To this end a special field, field 070, has been introduced. The contents of its subfields A and B give information on the existing bibliographic levels. On the basis of that information it is possible to write a simple computer program to convert data to the CCF in its pure form.

---

* Remark:     For this field the same field tag as in 'IDIN MANUAL'[8] has been adopted.

The instructions should be the following:

If 070B exists (thus indicating that the record contains 2 levels), create field 080, which will always contain the code 02 in subfield A and the code 0 in subfield B. In addition, transfer the contents of field 070B to the CCF field 015 (bibliographic level of secondary segment). Transfer the contents of field 070A to the character position 7 of the record label. (See 'Implementation Notes'[5], page 12)

Example:

If the field 070 contains ^AA^BM, the CCF field 080 should be created containing ^A02^B0 and the CCF field 015 should be created containing ^AM, while the character position 7 of the record label should contain the contents of the subfield A, namely A (analytic).

## 6.6 The model database structure overview

Finally, let us make some conclusions concerning the model database structure offered here.

The model database internal format is based on the CCF. This actually means that its field tags and subfield codes are identical to those in the CCF. However, the model database differs from the CCF in the following ways:

1. It does not use all of the CCF fields and subfields.

2. It does not make use of indicators; therefore for exchange purposes one should supply default value indicators.

3. In order to describe a target item and its parent item within one record, a separate set of fields (so called 2nd level fields) has been introduced for the description of the parent item. The information on bibliographic levels (the first and the second) is kept in a field 070 (which does not exist in the CCF). On the basis of that information it is possible to achieve the CCF segment structure at an exchange stage.

# LIST OF WATER-RELATED THESAURI IN ENGLISH

## 1. WATER RESOURCES THESAURUS, 1980 ed.

(U.S. DEPARTMENT OF THE INTERIOR, Office of Water
Research and Technology, Washington, D.C.20204)
For sale by the Superintendent of Documents,
U.S.Goverment Printing Office, Washington, D.C.20204

## 2. THESAURUS FOR FLUID ENGINEERING, 1981

Edited by N.G.Guy, published by BHRA Fluid Engineering,
Cranfield, Bedford, MK43 OAJ, England

## 3. PRELIMINARY THESAURUS - DELFT HYDRO DATABASE

DELFT HYDRAULICS, P.O.Box 177, 2600 MH Delft,
The Netherlands

## 4. THESAURUS OF ROCK AND SOIL MECHANICS TERMS

J.P.Jenkins and A.M.Smith,
Pergamon Press Ltg., Headington Hill Hall,
Oxford OX3 OBW, England

## 5. AQUALINE THESAURUS

Compiled by Joyce G.Smith, Edited by Peter J.Russell,
Published for the WATER RESEARCH CENTRE by ELLIS
HORWOOD LIMITED, Publishers Chichester

## 6. GEOREF THESAURUS AND GUIDE TO INDEXING,

Third Edition, 1981, American Geological Institute
American Geological Institute, 5205 Leesburg Pike,
Falls Church, Virginia 22041, 703/379-2480

# FIELD DEFINITION TABLE (F D T)
# FOR MODEL DATABASE

| TAG | FIELD NAME | SUBFIELDS | REP | LTH* | TYPE |
|-----|-----------|-----------|-----|------|------|
| 001 | Record identifier MFN (Reserved for record identifier (MFN) when exporting or importing data) | | | | |
| 020 | Source of record (Reserved for inputting agency code when exporting or importing data) | | | | |
| 021 | Completeness of record (Reserved for completeness of record code when exporting data to agencies that require it) | | | | |
| 022 | Date of record entry | A | | 15 | X |
| 030 | Character sets used in record (Reserved for character set when exporting data to agencies that require it) | | | | |
| 031 | Language of record | A | | 3 | X |
| 040 | Language of text | A | | 3 | X |
| 070 | Bibliographic level | AB | | 10 | X |

| 100 | ISBN | A | | 15 | X |
|---|---|---|---|---|---|
| 102 | CODEN | A | | 20 | X |
| 120 | Document number | A | R | 25 | X |
| 200 | Title (as on the item) | A | | 450 | X |
| 002 | Title (in language of record) | A | | 450 | X |
| 003 | Title (in English) | A | | 450 | X |
| 260 | Edition | A | R | 20 | X |
| 300 | Personal author | ABCF | R | 140 | X |
| 310 | Name of corporate body | ABDEG | R | 520 | X |
| 330 | Affiliation (in language of item) | ABDE | R | 440 | X |
| 400 | Place of publication/ Publisher | ABD | R | 250 | X |
| 440 | Date of publication | B | | 8 | X |
| 460 | Physical description | ABD | | 140 | X |
| 490 | Part statement (except for journals) | AB | | 30 | X |
| 500 | Note | A1 | | 230 | X |
| 510 | Note on bibliographic relationship | A | | 210 | X |

| | | | | | |
|---|---|---|---|---|---|
| 610 | Classification scheme notation | AB | | 45 | X |
| 620 | Subject descriptor (in language of record) | A | R | 350 | X |
| 622 | Geographic descriptor (in language of record) | A | R | 110 | X |
| 625 | Subject descriptor (in English) | A | R | 350 | X |
| 626 | Geographic descriptor (in English) | A | R | 110 | X |
| 600 | Abstract (in language of record) | A | | 1650 | X |
| 601 | Abstract (in English) | A | | 1650 | X |
| 013 | Location of the document | A | R | 210 | X |
| 014 | Identification number at the location | A | R | 40 | X |
| 710 | Monograph title (as on the item) 2nd level | A | | 270 | X |
| 711 | Monograph title (in language of record) 2nd level | A | | 270 | X |
| 712 | Monograph title (in English) 2nd level | A | | 270 | X |
| 713 | Edition 2nd level | A | R | 30 | X |

| | | | | | |
|---|---|---|---|---|---|
| 714 | Publisher<br>2nd level | ABD | R | 200 | X |
| 715 | Date of publication<br>2nd level | B | | 8 | X |
| 716 | ISBN<br>2nd level | A | | 15 | X |
| 720 | Personal author(s)<br>2nd level | ABCF | R | 130 | X |
| 730 | Corporate author(s)<br>2nd level | ABDEG | R | 210 | X |
| 740 | Serial title<br>2nd level | A | | 220 | X |
| 101 | ISSN<br>2nd level | A | | 15 | X |
| 741 | Country code | A | | 5 | X |
| 742 | Part statement<br>2nd level | AB | | 50 | X |
| 320 | Meeting<br>2nd level | A1EGI | | 630 | X |

---

* LTH - Field length
   This is a number indicating the expected length of a field. It cannot be greater than 1650 characters (which corresponds to one worksheet page), because a field cannot span between two worksheet pages. If the field is defined as scrolling the length is only limited by the maximum record length.

# DATA ENTRY WORKSHEET FOR MODEL DATABASE
## (with a model record as contents)

## FIRST LEVEL FIELDS

---

**22ᵉ-Date of record entry**          ^a*19870719*

---

**31-Language of record**   ^a*scr*     **40-Language of text**    ^a*eng*

---

**70-Bibliographic level**   ^a*A*^b*M*     **100-ISBN**

---

**102-CODEN**                 **120-Document number**
    **(for serial)**

---

| | |
|---|---|
| **200-Title**<br>(as on the item) | ^a*Systems and solutions for wastewater treatment in the biggest Yugoslav refinery* |

---

| | |
|---|---|
| **2-Title**<br>(in lang. of record) | ^a*Sistemi i rešenja za prečišćavanje otpadnih voda u najvećoj rafineriji nafte u Jugoslaviji* |

---

| | |
|---|---|
| **3-Title**<br>(in English) | ^a*Systems and solutions for wastewater treatment in the biggest Yugoslav refinery* |

---

**300-Personal author(s)**       ^a*Legović*^b*B.%*^a*Nikolić*^b*O.*

---

| | |
|---|---|
| **310-Name of corporate**<br>**body (as on item)** | ^a*Rafinerija INA*^b*Odelenje za zaštitu životne sredine*^d*Rijeka* |

---

**330-Affiliation**
(in lang.of item)

^aRafinerija INA^bOdelenje za zaštitu
životne sredine^dRijeka^eJugoslavija%
^aRafinerija INA^bOdelenje za zaštitu
životne sredine^dRijeka^eJugoslavija

**260-Edition**

**400-Place of publication**
/Publisher

**440-Date of publication**

**460-Physical description**

**490-Part statement**          ^b101-107

**500-Note**

**510-Note on bibliographic**
relationship

**610-Classification scheme**
notation

**620-Subject descriptor**
(in lang.of record)

^aOTPADNE VODE%^aRAFINERIJE
NAFTE%^aZAGADJENJE MORA%
^aPOSTROJENJA ZA PREČIŠĆAVANJE

**625-Subject descriptor**
(in English)

^aWASTEWATERS%^aOIL REFINERIES%
^aSEA POLLUTION%^aTREATMENT
PLANTS

| | |
|---|---|
| **622-Geographic descriptor** (in lang. of record) | ^aRIJEKA%^aJADRANSKO MORE %^aJUGOSLAVIJA%^aSREDOZEMNO MORE |

| | |
|---|---|
| **626-Geographic descriptor** (in English) | ^aRIJEKA TOWN%^aADRIATIC SEA% ^aYUGOSLAVIA%^aMEDITERRANEAN SEA |

| | |
|---|---|
| **600-Abstract** (in lang. of record) | ^aDat je prikaz tehnologije obrade otpadnih voda iz rafinerije ... |

| | |
|---|---|
| **601-Abstract** (in English) | ^aThis paper aims at presenting ... |

| | |
|---|---|
| **13-Location of the** document | ^aInstitut za vodoprivredu 'Jaroslav Černi', Beograd |

| | |
|---|---|
| **14-Identification number** at the location | ^a16275 |

## SECOND LEVEL FIELDS

| | |
|---|---|
| **710-Monograph title** (as on the item) | ^aPollution of Mediterranean Sea |

| | |
|---|---|
| **711-Monograph title** (in language of record) | ^aZagadjenje Sredozemnog mora |

| | |
|---|---|
| **712-Monograph title** (in English) | ^aPollution of Mediterranean Sea |

**713-Edition**

| 714-Publisher | ^aBelgrade^bYugoslav Society of Water Pollution Control^dYugoslavia |

| 715-Year of publication /issue | ^b1985 |

**716-ISBN**

**720-Personal author(s)**

| 730-Corporate author(s) | ^aYugoslav Society of Water Pollution Control^dBelgrade^eYugoslavia |

**740-Serial title**

**101-ISSN**

**741-Country code**

**742-Part statement**

| 320-Meeting | ^aInternational Regional Conference on the Pollution of the Mediterranean Sea^lInternational Regional Conference on the Pollution of the Mediterranean Sea^gSplit^eYugoslavia^i2-5 Oct. 1985 |

* <u>Remark:</u> CDS/ISIS accepts tag 022 as 22
031 as 31
040 as 40
070 as 70
002 as 2
003 as 3
013 as 13
014 as 14

# DISPLAY FORMATS FOR MODEL DATABASE

Format with field labels in English


MFN(4),
MHL," AUTHOR (INSTITUTION):"D300,C31(|; |+V300^A(30,30)|, |V300^B(30,30),
1| (|V330(30,30)|)|)%#
"       CORPORATE BODY:"C31,V310(30,30)%##
'       TITLE'/
"       Original:"C31,V200(30,30)%#
"       English:"C31,V3(30,30)%##
"       LANGUAGE OF TEXT:"C31,V40(30,30)%#
"       PHYSICAL DESCRIPTION:"C31,V460%##
"       SUBJECT DESCRIPTORS:"D625,C31(V625(30,30)+|; |)%#
"       GEOGRAPHIC DESCRIPTORS:"D626,C31(V626(30,30)+|; |)%##
"       ABSTRACT"/#C6,V601(5,5)%##
"       MONOGRAPH TITLE"/
"       Original:"C31,V710(30,30)%#
"       English:"C31,V712(30,30)%##
"       AUTHOR (MONOG.):"D720,C31,V720^A(30,30)|, |,V720^B(30,30)%#
"       CORPORATE BODY:"C31,V730(30,30)%##
"       MEETING"/
"       Original title:"C31,V320^A(30,30)%#
"       English title:"C31,V320^1(30,30)%#
"       Date:"C31,V320^I%#
"       Place:"C31,V320^G(30,30)|, |V320^E(30,30)%##
"       PUBLISHER:"C31,V714^B(30,30),|, |V714^A(30,30),|, |V714^D(30,30)%#
"       EDITION:"C31,V713(30,30)%#
"       PUBLISHER:"C31,V400^B(30,30),|, |V400^A(30,30),|, |V400^D(30,30)%#
"       EDITION:"C31,V260(30,30)%#
"       JOURNAL:"C31,V740(30,30),|, |V741(30,30)%#
"       ISSN:"C31,V101%#
"       PART STATEMENT:"C31,V742^A(30,30)|, |,|p. |V742^B,|, |V715|.|%#
"       REMARK:"C31,V510(30,30)%#
"       ISBN:"C31,V100(30,30)%#
"       ISBN:"C31,V716(30,30)%#
"       PART STATEMENT:"D490,C31,V490^A(30,30)|, |,|p. |V490^B(30,30),|, |
V440(30,30)|.|,|, |V715(30,30)|;|%#
"       NOTE:"C31,V500(30,30)%##
"       LOCATION OF DOCUMENT:"C31,V13(30,30)%#
"       IDENTIFICATION NUMBER:"C31,V14(30,30)%#####

Format with field labels in Serbo-Croatian

MFN(4),
MHL," AUTOR (INSTITUCIJA):"D300,C31(|; |+V300^A(30,30)|, |V300^B(30,30),
| (|V330(30,30)|)|)%#
"        ODGOVORNA INSTITUCIJA:"C31,V310(30,30)%##
,        NASLOV'/
"        Original:"C31,V200(30,30)%#
"        Srpskohrvatski:"C31,V2(30,30)%#
"        Engleski:"C31,V3(30,30)%##
"        DESKRIPTORI:"D620,C31(V620(30,30)+|; |)%#
"        GEOGRAFSKI DESKRIPTORI:"D622,C31(V622(30,30)+|; |)%##
"        APSTRAKT"/#C6,V600(5,5)%##
"        NASLOV MONOGRAFIJE"/
"        Original:"C31,V710(30,30)%#
"        Srpskohrvatski:"C31,V711(30,30)%#
"        Engleski:"C31,V712(30,30)%##
"        AUTOR MONOGRAFIJE:"D720,C31,V720^A(30,30)|, |,V720^B(30,30)%#
"        ODGOVORNA INSTITUCIJA:"C31,V730(30,30)%##
"        NAZIV KONFERENCIJE"/
"        Original:"C31,V320^A(30,30)%#
"        Engleski:"C31,V320^1(30,30)%#
"        Vreme:"C31,V320FC^I%#
"        Mesto:"C31,V320^G(30,30)|, |V320^E(30,30)%##
"        IZDAVAČ:"C31,V714^B(30,30),|, |V714^A(30,30),|, |V714^D(30,30)%#
"        IZDANJE:"C31,V713(30,30)%#
"        IZDAVAČ:"C31,V400^B(30,30),|, |V400^A(30,30),|, |V400^D(30,30)%#
"        IZDANJE:"C31,V260(30,30)%#
"        ČASOPIS:"C31,V740(30,30),|, |V741(30,30)%#
"        ISSN:"C31,V101%#
"        KOLACIJA:"C31,V742^A(30,30)|, |,|st. |V742^B,|, |V715|.|%#
"        PRIMEDBE:"C31,V510(30,30)%#
"        ISBN:"C31,V100(30,30)%#
"        ISBN:"C31,V716(30,30)%#
"        KOLACIJA:"D490,C31,V490^A(30,30)|, |,|st. |V490^B(30,30),|, |V440(30,30)
|.|,|, |V715(30,30)|.|%#
"        PRIMEDBE:"C31,V500(30,30)%##
"        DOKUMENT DEPONOVAN:"C31,V13(30,30)%#
"        IDENTIFIKACIONI BROJ:"C31,V14(30,30)%#####

# INVERTED FILE FST FOR MODEL DATABASE

| ID | IT | DATA EXTRACTION FORMAT |
|----|----|----|
| 3 | 4 | mhl,V3 |
| 40 | 0 | mhl,"LA="V40 |
| 300 | 0 | mhl,(\|AU=\|V300^A\| \|,V300^B/) |
| 440 | 0 | mhl,"YEAR="V440 |
| 620 | 0 | mhl,(\|S=\|V620/) |
| 622 | 0 | mhl,(\|GS=\|V622/) |
| 625 | 0 | mhl,(\|E=\|V625/) |
| 626 | 0 | mhl,(\|GE=\|V626) |
| 710 | 0 | mhl,"MT="V710 |
| 710 | 0 | mhl,"MT="V711 |
| 710 | 0 | mhl,"MT="V712 |
| 715 | 0 | mhl,"YEAR="V715 |
| 720 | 0 | mhl,(\|AU=\|V720^A\| \|,V720^B/) |

## Legend:

**ID** - Field identifier (a qualifier which can be used during searching by experienced users who use the Search Language)

**IT** - Indexing technique, specifies a particular processing to be performed on the data produced by the data extraction format,

    **0** - Invert a whole field (i.e.the first 30 characters of a field)

    **4** - Invert each word of a field except for nonsignificant ones defined in the stopword file

**Remarks:** 1. Prefix literals: AU=, YEAR=, LA=, S=, E=, GS=, GE=, MT=, are used to create the corresponding groups of terms within the dictionary.

        2. ID 710 is used to store data from three different fields (710, 711, 712) which, in fact contain the same data, i.e. monograph title, MT. This enables that a group of fields (710, 711, 712) is seen by CDS/ISIS as one field during searching.

        3. For details on how to create a stopword file see Mini-micro CDS/ISIS Reference Manual[4], page 226.

# RECORD SAMPLE PRINTED USING FORMAT
# WITH FIELD LABELS IN ENGLISH

0003 AUTHOR (INSTITUTION):      Legović, B. (Odeljenje za zaštitu životne
sredine, Rafinerija INA, Rijeka, Jugoslavija);
Nikolić, O. (Odeljenje za zaštitu životne
sredine, Rafinerija INA, Rijeka, Jugoslavija)

CORPORATE BODY:      Rafinerija INA, Rijeka, Jugoslavija

TITLE
Original:      Systems and solutions for wastewater
treatment in the biggest Yugoslav oil refinery

English:      Systems and solutions for wastewater
treatment in the biggest Yugoslav oil refinery

SUBJECT DESCRIPTORS:      WASTEWATERS; OIL REFINERIES; SEA
POLLUTION; TREATMENT PLANTS

GEOGRAPHIC DESCRIPTORS: RIJEKA TOWN; YUGOSLAVIA;
ADRIATIC SEA; MEDITERRANEAN SEA

ABSTRACT

This paper aims at presenting the technology of wastewater treatment at the INA Oil Refinery of Rijeka town applied in the past and in the early eighties when much stricter standards for their discharge into the sea developed a new approach to wastewater management. The refinery of Rijeka, built in the middle of the sixties, was not designed with water economy and water treatment in mind: its water consumption was very high and the polluted and clean water streams were intermixed in the combined sewer system. This resulted in high wastewater flows and in high pollutant loads per ton of crude oil. Nowadays, the wastewater treatment programme includes in-plant control measures and a modern wastewater treatment plant. The in-plant control includes the pretreatment of sour condensates and of the recirculating water cooling and collecting each category of wastewater in a separate sewer system.

MONOGRAPH TITLE
Original:      Pollution of Mediterranean Sea
English:      Pollution of Mediterranean Sea

CORPORATE BODY:      Yugoslav Society of Water Pollution Control

MEETING
Original:                          International Regional Conference on the
                                   Pollution of the Mediterranean Sea
English:                           International Regional Conference on the
                                   Pollution of the Mediterranean Sea
Date:                              2-5 Oct. 1985
Place:                             Split, Yugoslavia

PUBLISHER:                         Yugoslav Society of Water Pollution Control,
                                   Beograd, Yugoslavia
PART STATEMENT:                    p. 101-107, 1985.

LOCATION OF DOCUMENT:              Institut za vodoprivredu 'Jaroslav Černi',
                                   Beograd
IDENTIFICATION NUMBER:             16275

# TABLE OF EQUIVALENTS

| MODEL DATABASE FIELDS | CCF FIELDS (pages*) |
|---|---|
| 001 Reserved for record identifier (MFN) when exporting or importing data | 001 Record identifier (p. 47) |
| 020 Reserved for inputting agency code when exporting or importing data | 020 Source of record (p.51) |
| 021A Reserved for completeness of record code when exporting data to agencies that require it | 021A Level of completeness code (p. 53) |
| 022A Date of record entry | 022A Date entered on file (p. 54) |
| 030 Reserved for character set when exporting data to agencies that require it | 030 Character sets used in record (p. 56) |
| 031A Language of record | 031A Language of the record (p. 58) |
| 040A Language of text | 040A Language of the item (p. 59) |

---

* **Remark:** Pages refer to the CCF basic document[4].

**070 Bibliographic level**
070A First level

No tag Character 7 of CCF
record label (p. 17)

070B Second level

015A Bibliographic level
of secondary segment
(p. 24)

**080 Segment linking field**
080A Segment relationship
code
080B Segment indicator
code

**100A ISBN**

**100A International Standard
Brok Number (ISBN)**
(p. 75)

**101A ISSN**
2nd level

**101A International Standard
Serial Number (ISSN)**
(p. 77)

**102A CODEN**

**102A CODEN (For serials)**
(p. 79)

**120A Document number**

**120A Document
identification number**
(p. 82)

**200A Title**
(original, as on the
item)

**200A Title**
(p. 83)

**002A Title**
(in language of record)

-------

**003A Title**
(in English)

-------

**260A Edition**

**260A Edition statement**
(p. 98)

| 300 | Personal author | 300 | Name of person |
|---|---|---|---|
| | 300A Surname | | 300A Entry element |
| | 300B Other name elements | | 300B Other name elements |
| | 300C Additional elements to name | | 300C Additional elements |
| | 300F Role | | 300F Role (non-coded) (p. 100) |

| 310 | Name of corporate body | 310 | Name of corporate body |
|---|---|---|---|
| | 310A Main body | | 310A Entry element |
| | 310B Sub-body | | 310B Other parts of name |
| | 310D City | | 310D Address of corporate body |
| | 310E Country | | 310E Country of corporate body |
| | 310G Role | | 310G Role (non-coded) (p. 104) |

| 320 | Name of meeting 2nd level | 320 | Name of meeting |
|---|---|---|---|
| | 320A Meeting name and number (in original lang.) | | 320A Entry element |
| | 3201 Meeting name and number (in English) | | 320J Number of meeting ------- |
| | 320G City | | 320G Location of meeting |
| | 320E Country | | 320E Country |
| | 320I Date (free format) | | 320I Date of meeting (in free format) (p. 107) |

| 330 | Affiliation (in language of item) | 330 | Affiliation |
|---|---|---|---|
| | 330A Name of organization | | 330A Entry element |
| | 330B Other parts of the name | | 330B Other parts of the name |
| | 330D City | | 330D Address |
| | 330E Country | | 330E Country of affiliation (p. 110) |

| 400 | Place of publication/ Publisher | 400 | Place of publication and publisher |
|---|---|---|---|
| | 400A Place of publication | | 400A Place of publication |
| | 400B Name of publisher | | 400B Name of publisher |
| | 400D Country of publisher | | 400D Country of publisher (p. 112) |

| | | | |
|---|---|---|---|
| **440** | **Date of publication**<br>440B Year of publication | **440** | **Date of publication**<br>440B Date in non-formalized<br>form (p. 118) |
| **460** | **Physical description**<br>460A Number of pieces and<br>designation<br>460B Other descriptive<br>details<br>460D Accompanying material | **460** | **Physical description**<br>460A Number of pieces and<br>designation<br>460B Other descriptive<br>details<br>460D Accompanying material<br>(p. 124) |
| **490** | **Part statement**<br>(except for journals)<br>490A Volume/part<br>numeration<br>490B Pagination defining<br>a part | **490** | **Part statement**<br><br>490A Volume/part<br>numeration<br>490B Pagination defining<br>a part (p. 129) |
| **500** | **Note**<br>500A in language of record<br>5001 in English | **500** | **Note**<br>(p. 131) |
| **510A** | **Note on bibliographic<br>relationship** | **510A** | **Note on bibliographic<br>relationship**<br>(p. 132) |
| **610** | **Classification scheme<br>notation**<br>610A Notation<br>610B Name of classification<br>scheme | **610** | **Classification scheme<br>notation**<br>610A Notation<br>610B Name of classification<br>scheme (p. 138) |
| **620** | **Subject descriptor**<br>620A Subject descriptor<br>(in language of record)<br>620B Identification of<br>subject system (in<br>language of record) | **620** | **Subject descriptor**<br>620A Subject descriptor<br><br>620B Identification of<br>subject system (in<br>language of record)<br>(p. 139) |
| **622A** | **Geographic descriptor**<br>(in language of record) | | -------- |

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|---|---|
| **625 Subject descriptor**<br>**(in English)**<br>625A Subject descriptor<br>(in English)<br>625B Identification of subject<br>system (in English) | ------- |
| **626A Geographic descriptor**<br>(in English) | -------- |
| **600A Abstract**<br>(in language of record) | **600A Abstract**<br>(p. 136) |
| **601A Abstract**<br>(in English) | -------- |
| **013A Location of the document** | -------- |
| **014A Identification number**<br>**at the location** | -------- |
| **710A Monograph title**<br>(as on the item)<br>2nd level | **200A Title**<br>(p. 83) |
| **711A Monograph title**<br>(in language of<br>record) 2nd level | -------- |
| **712A Monograph title**<br>(in English)<br>2nd level | -------- |
| **713A Edition**<br>2nd level | **260A Edition statement**<br>(p. 98) |
| **714 Publisher**<br>2nd level<br>714A Place of publication<br>714B Name of publisher<br>714D Country of publisher | **400 Place of publication**<br>**and publisher**<br>400A Place of publication<br>400B Name of publisher<br>400D Country of publisher<br>(p. 112) |

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|---|---|---|---|---|
| **715** | **Date of publication**<br>2nd level<br>**715B** Year of publication | | **440** | **Date of publication**<br><br>**440B** Date in non-formalized<br>form (p. 118) |
| **716A** | **ISBN**<br>2nd level | | **100A** | **International Standard**<br>**Book Number (ISBN)**<br>(p. 75) |
| **720** | **Personal author(s)**<br>2nd level<br>**720A** Surname<br>**720B** Other name elements<br>**720C** Additional elements to<br>name<br>**720F** Role | | **300** | **Name of person**<br><br>**300A** Entry element<br>**300B** Other name elements<br>**300C** Additional elements<br><br>**300F** Role (non-coded)<br>(p. 100) |
| **730** | **Corporate author(s)**<br>2nd level<br>**730A** Main body<br>**730B** Sub-body<br>**730D** City<br><br>**730E** Country<br><br>**730G** Role | | **310** | **Name of corporate body**<br><br>**310A** Entry element<br>**310B** Other parts of name<br>**310D** Address of corporate<br>body<br>**310E** Country of corporate<br>body<br>**310G** Role (non-coded)<br>(p. 104) |
| **740A** | **Serial title**<br>2nd level | | **201A** | **Key title**<br>(p. 86) |
| **741A** | **Country code** | | ----- | |
| **742** | **Part statement**<br>2nd level<br>**742A** Volume/part<br>numeration<br>**742B** Pagination defining<br>a part | | **490** | **Part statement**<br><br>**490A** Volume/part<br>numeration<br>**490B** Pagination defining<br>a part (p. 129) |

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