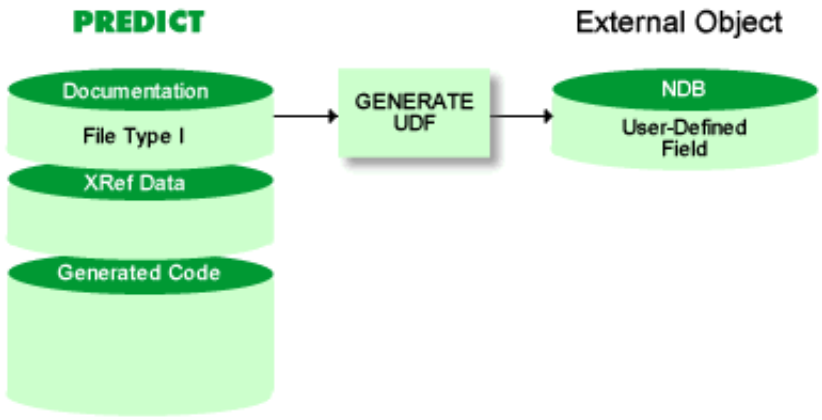
Generate for Natural

The following types of external objects can be generated for Natural:

- IMS User-Defined Fields
- Replace Verification Rule
- Data Definition Module

IMS User-Defined Fields



IMS UDFs are required to access data in IMS segments from Natural for DL/I programs. UDFs are used for mapping IMS segments to fields in DDMs.

IMS UDFs for physical or logical IMS segments can be generated from Predict file objects of type I. IMS UDFs contain the segment name and - in the case of physical IMS segments - the user-defined field definitions for one IMS segment.

When generating IMS UDFs for logical IMS segments, the IMS UDFs for physical IMS segments that the logical IMS segments are derived from are also generated if necessary (if they do not already exist or if the Predict file objects for the physical IMS segments have been modified since generation).

Rules Applying to the Generation of IMS UDFs

- In a first step the Generate IMS User-Defined Fields function collects file objects of the types I, K or J that are affected by the operation and displays them in a table. See Displaying all Predict file objects affected by UDF Generation.
- The offsets of the IMS descriptor fields in the IMS segment layout (file type J) are checked for consistency with the respective descriptor fields in IMS segments (file type I) before an IMS UDF is actually generated.
- A database and file number is assigned to the newly generated IMS UDF.
  DDMs use this database number and file number.
- If differences between the format of IMS descriptor fields in the NDB and the respective format definitions of Predict are detected, the IMS descriptor field formats in the NDB are changed.
  Differences can occur if the descriptor fields have the format packed or packed-signed.

Calling the Function

The Generate IMS UDF screen is displayed with function code G and object code UD in a Predict main menu, or with the command GENERATE UDF

```
13:45:33              *****  P R E D I C T  4.2.2   *****           2002-07-31
Plan   0                     - Generate IMS UDF -




File ID ........... HNO-FI1
Contained in DA ...


Overwrite option .. Y  (Y,N)
List IMS segment .. Y  (Y,N)
```

Values for input fields which have been locked by your data dictionary administrator cannot be overwritten. These fields are skipped when positioning the cursor with the TAB key. See Generation Defaults.

Parameters	
File ID	ID of the Predict file object from which UDF is to be generated. The file must be of type I.
Contained in DA	ID of the Predict database containing the file. Must be of type I and the file list of the database must contain the file.
Overwrite option	**Y** Existing UDFs are overwritten by the newly generated UDFs.
List IMS segment	**Y** The generated fields are to be listed.

Displaying all Predict File Objects Affected by UDF Generation

Before actually generating IMS UDFs, Predict checks which file objects of the types I, K or J are affected and displays the results of this check in a table.

```
13:00:32             *****  P R E D I C T  4.2.2   *****           2002-07-31
                             - Checked IMS files -
                                File  Segm.
File name                       Type  Type    Relation       Udf      DBnr/Fnr

PARTUSED-LCONTD                  I     L      entered file   nonexist
ARTICLE-CONTAIND                 I     V      virt.child
ARTICLE-PART                     I     P      log.parent     nonexist
ARTICLE-CONTAINS                 I     C      real.child     nonexist
```


Columns in the Table	
File name	ID of a Predict file object.
File Type	Predict file type.
Segment Type	Type of IMS segment.
Relation	How the Predict file object is related to the file to which the generation function is applied **entered file**: File to which the generation function is applied. **phys. file**: For a logical segment, the physical segment from which it is derived. **log child**: For a concatenated segment derived from a logical child and its logical parent, the logical child from which it is derived. **log. parent**: For a concatenated segment, the parent segment from which it is derived. **virtual child**: For a concatenated segment derived from a virtual logical child and the physical parent of its paired real logical child, the virtual logical child from which it is derived. **real child**: For a virtual logical child segment the real logical child segment from which it is derived.
UDF	Status of the UDF **generated**: UDF exists for the file **modified**: The Predict file/field objects have been modified after generation of the UDF. **nonexist**: UDF does not exist **invalid**: The generated UDF points to a wrong DBNR, i.e. the database number is not defined as IMS or DL/I database number in the Natural parameter module via the NTDB macro **not found**: The generated UDF is deleted **UDF diff.**: The segment in the UDF differs from the segment name in the file, i.e. the generated segment was modified with an external utility.
DBnr/Fnr	Database and file number assigned to the UDF. **Note:** If a DDM for Natural IMS or DL/I is to be generated, all related IMS UDFs must be of status generated.

Generate IMS User-Defined Fields in Batch Mode

Command: GENERATE UDF

Enter parameters on next line in positional or keyword form. File ID is obligatory, all other parameters are optional. If a parameter is not specified, the default value is taken.

Field	Keyword	Position
File ID	FILE-ID	1
Contained in DA	DATABASE-ID	2
Overwrite option	REPLACE	3
List IMS segment	LIST	4

Sample Output

```
13:29:33            *****  P R E D I C T  4.2.2   *****            2002-07-31
                             - List IMS UDFs -                      Page:   1
Database: PARTUSED                                          DBD:
File    : PARTUSED-LCONTD                                IMS Segment: LCONTD
                                                         Seg. length: 600-700

  T  L DB Field name                       F   Length   D  Occ  Offset Var
  -- - -- ------------------------------- -- -------- --- --- ------- ---
     1 NG PARTNO                          N      3.0  SRC         201
     1 NH PARTNAME                        A     20.0  SRC         291
     1 NI XPART                           A     20.0  AIX         200
**** IMS udf generated ( Dbnr: 153 Fnr:  84 ) ****
```

Replace Verification Rule

The Replace Verification Rule function can be applied only to rules of status automatic. A rule is assigned status automatic by applying the function Generate DDM to the file containing the field that the corresponding Verification object is linked to via *Is verified by VE*.

The function Replace Verification Rule replaces the code of the rule; all links to fields remain unchanged.

Calling the Function

The Replace Verification Rule screen is displayed with function code G and object code RU in a Predict main menu, or with the command GENERATE RULE.

```
09:40:26            *****  P R E D I C T  4.2.2   *****            2002-07-31
 Plan   0               - Replace Verification Rule -




 Rule ID ..............


 List related fields ... Y  (Y,N)
 List related maps ..... Y  (Y,N)
 List generated rule ... Y  (Y,N)
```

Values for input fields which have been locked by the data dictionary administrator cannot be overwritten. These fields are skipped when positioning the cursor with the TAB key. See Generation Defaults.

Parameters	
Rule ID	ID of the Predict verification object from which the verification rule is to be generated.
List related fields	**Y** The IDs of all fields connected to this verification rule via *Is verified by VE* are to be listed.
List related maps	Natural maps using replaced verifications are to be recataloged so that they use the new verification rules. List related maps helps to find these maps. **Y** The IDs of all maps connected to this verification rule are to be listed.
List generated code	**Y** The generated code is to be listed.

Replace Verification Rule in Batch Mode

Command: GENERATE RULE

Enter parameters on next line in positional or keyword form. Rule ID is obligatory, all other parameters are optional. If a parameter is not specified, the default value is taken.

Field	Keyword	Position
Rule ID	RULE-ID	1
List related fields	RELATE	2
List generated code	LIST	3
List related maps	RELATED-MAPS	4

Sample Output

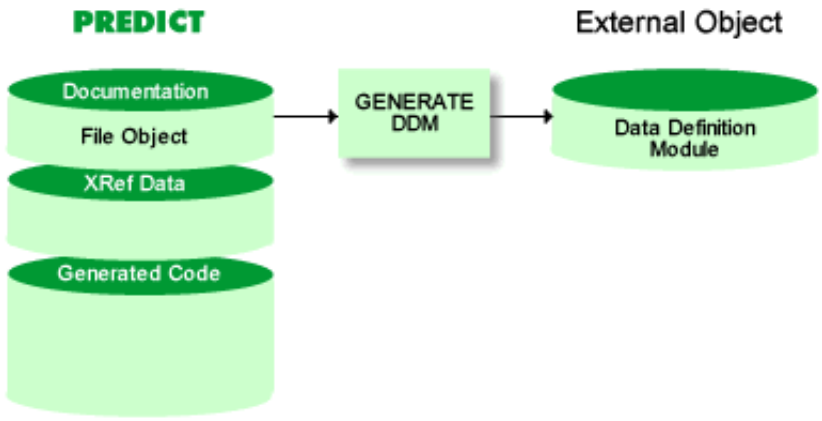
```
13:04:07            *****  P R E D I C T  4.2.2   *****            2002-07-31
                      - Replace Verification Rule -                 Page:   1

    Link of Verification GEN-CHECK-ZERO to Elementary Fields
           File Name                       Field Name               Remark
------------------------------ ------------------------------ -------------
GENERATION-EXAMPLE             ELE-N-9V5                      activ
                               ELE-PS-5V2                     activ
                               PC-MC-PS-6V1                   activ
Gen-examples                   Ele-N-9V5                      not activ
                               Ele-PS-5V2                     not activ
                               PC-MU-PS-6V1                   not activ
```

```
13:04:07            *****  P R E D I C T  4.2.2   *****            2002-07-31
                      - Replace Verification Rule -                 Page:   2
Rule: GEN-CHECK-ZERO

0010 * ************************************************************************
0020 * Verification: GEN-CHECK-ZERO generated by Predict                      *
0030 *  with format: Numeric; Type: Not Equal;                                *
0040 *           on: 2002-07-31; at: 13:03:46; from user: SMR;                *
0050 ************************************************************************
0060 IF & = 0
0070 REINPUT 'Invalid value(s): ''0'' .'
0080         MARK *&
```

Data Definition Module



Rules Applying to the Generation of DDMs

- If Natural Security is installed and the specified file is defined to Natural Security, the same checks are performed as are performed before a DDM can be regenerated or a file can be added. See description of the parameter DDM Modifier in the section **File Maintenance** of the **Natural Security documentation**.
- A DDM generated for a physically coupled file contains the ID of the file to which it is coupled and the short names of the fields via which they are coupled as a comment. For example: "Coupled via AA to GA of FINANCE".
- The names of the Predict file and its userviews begin with SYSDIC. When a DDM is generated for a file whose name begins with SYSDIC, the logical database number (255) and logical file number (253) that point to the FDIC are taken.
- If the file (which has a DDM) was renamed, the old DDM is purged in the Generate DDM function and the new DDM is added. If Natural Security objects or Super Natural objects exist for the old DDM, these objects are renamed too.

Note:
Rules applying to the generation of DDMs for use with IMS or Adabas Vista are described in the sections Generating DDMs for Use with IMS and Generating a DDM for Use with Adabas Vista.

When generating DDMs on Windows or UNIX platforms and the FDIC file is located on the mainframe, the DDM will not be available on the mainframe. It will be stored only in the file system where FNAT is located.
When generating DDMs on the mainframe and the FDIC file is also located on mainframe, the DDM will not be available on the Windows or UNIX platform.
The function must be executed twice.

Calling the Function

The Generate a DDM screen is displayed with function code G and object code DD in a Predict main menu, or with the command GENERATE DDM.


```
13:44:32            *****  P R E D I C T  4.2.2   *****            2002-07-31
Plan  10                     - Generate a DDM -

Current VM ............. HOME
File ID ................
Contained in DA ........

Overwrite option ....... Y  (Y,N)          For ADABAS
List generated code .... Y  (Y,N)            Use Vista access-nr ..* N
ADABAS version ........* I1                For SQL
                                             Truncate creator ........ N (Y,N)
Field name prefix ......                   For IMS
Line comments .........* Y                   Generate UDFs ........... Y (Y,N)
Abstract ............... 3  (0-16)          Replace modified UDFs ... Y (Y,N)
General comments ....... Y  (Y,N)            List UDFs ............... Y (Y,N)
                                             IMS field suffix ........ N (Y,N)
Generate verif. rules .. Y  (Y,N)          For NATURAL Subsystems
Replace verif. rules ..* N                   Generate security ....... N (Y,N)
List verif. rules ...... Y  (Y,N)            SUPER NATURAL file opt .. N (Y,N)

Command ===>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help  Next  Stop  Last  LnkEl Flip  Print Impl  AdmFi SelFi Prof  Main
```

Values for input fields which have been locked by your data dictionary administrator cannot be overwritten. These fields are skipped when positioning the cursor with the TAB key. See Generation Defaults.

Presettings	
The parameters below can be changed in the Modify DDM Defaults screen. See Generation Defaults.	
Specification DB ID	Only applicable to Adabas files and userviews. **Y** Database ID **must** be specified. **N** Database ID **may** be specified. **D** Database ID **may not** be specified This parameter is set to N at installation.
Money format (for SQL)	**N** Unpacked numeric **P** Packed numeric
Super Natural file DBNR	The database number of the Super Natural system file must be supplied by the DDA if the Super Natural file is not the current FUSER file at generation time. This parameter is set to 0 at installation.

VSAM trailing BLANK char	If a VSAM prefix name contains trailing blanks, these blanks must be represented in Predict with a special character (because trailing blanks cannot be entered in Predict). When generating a DDM for Natural VSAM the special character specified is removed and the correct representation of a blank inserted. A VSAM trailing BLANK char. is not defined at installation. We recommend setting this parameter to $.
Super Natural file FNR	The file number of the Super Natural system file must be supplied by the DDA if the Super Natural file is not the current FUSER file at generation time. This parameter is set to 0 at installation.
Parameters	
Current VM	Virtual machine that is currently valid. A read only field. DDMs can be only generated from Predict file objects contained ● in the database of type local linked via *Contains DA* to the Current VM or ● in databases accessible via the network containing the Current VM. See Generating a DDM for Use with Adabas Vista for a description of how this parameter is evaluated when generating a DDM for use with Adabas Vista.
File ID	ID of the Predict file object from which the definitions are to be generated. Alpha characters must be entered in upper case.
Contained in DA	Depending on the setting of Specification DB ID in the Modify DDM defaults screen, entry of a database ID is mandatory, optional, or prohibited for Adabas files and userviews. See Presettings above. If a database is specified, its file list must contain the specified file and the database type must be compatible with the database type specified for this database number within the Natural Parameter Module (via NTDB macro). Enter an asterisk to display a list of databases for selection. Do not enter a Database ID for a DB2 table or view.
Overwrite option	**Y** An existing DDM is overwritten.
List generated code	**Y** Generated code is listed.
Adabas version	The version of Adabas for which the DDM is to be generated. Enter an asterisk for valid values or see Adabas Version for more information. The Adabas version you specify for DDM generation is independent of your installation platform.
Field name prefix	Prefix to be used for each generated field name. **Note:** This parameter does not apply if you are generating a DDM from an SQL file type. See list of SQL file types in Generating DDMs for Use with SQL below.

Line comments	**Y** The first abstract line from each Predict field object is truncated to 20 characters and appended as a line comment to the generated description. **N** No line comments are generated from Predict object. **O** The maximum number of abstract lines defined in Predict (0 - 16) are written as line comments.
Abstract	The number of Predict abstract lines to be included in the generated code as lines beginning with an asterisk.
General comments	**Y** Comment lines in the Predict file object (marked with ** or */ in field Type) are included. If the field synonym is used, the original field name is displayed. The date and time of the generation and the ID of the user who initiated it are inserted. Source fields of sub/super/hyperdescriptors are also listed.
Generate verif. rules	**Y** The status of verification objects connected to fields of this file via *Is verified by VE* is changed to automatic.
Replace verif. rules	**Y** Verification objects of status automatic connected to fields of this file via *Is verified by VE* are regenerated if they have been modified since generation. **S** Verification objects of status automatic connected to fields of this file via *Is verified by VE* are regenerated only if they are not connected to any other file.
List verif. rules	**Y** List the IDs of all verification objects connected to each field.
For Adabas	
Use Vista access-nr	See table Meaning of Parameter Use Vista access-nr. **Note:** This parameter is only applicable to Adabas files and userviews. See also section Adabas Vista in the **Predict and Other Systems documentation**.
For SQL	
Truncate creator	**Y** The name of the generated DDM is the original SQL table/view name **without** the part that identifies the creator. **Note:** Only applicable to SQL file types. See Generating DDMs for Use with SQL.
For IMS	
Generate UDFs	**Y** User-defined fields for Natural for DL/I are generated or regenerated. Only applicable to files of type I, J, and K.
Replace UDFs	**Y** Any user-defined fields are replaced.

List UDFs	**Y** User-defined fields are to be listed.
IMS field suffix	**Y** The DDM field name is created using a compressed field name (or Natural synonym), hyphen and IMS segment name.
For Natural subsystems	
Generate security	Only applicable if Natural Security is installed and the user is authorized to create profiles. An authorized user is an administrator who either has no owners or is an owner of himself without countersignatures. **Y** An authorized user can create a Natural Security profile for the file whose DDM has just been generated.
Super Natural file opt.	This option can only be used by a Super Natural administrator. **Y** The file is to be declared to Super Natural and causes a list of Super Natural users to be displayed so that the administrator can specify which of them can use the file. If Natural Security is installed, the file is declared to Super Natural only if it is given, or already has, a Natural Security definition.

Generating DDMs for Use with IMS

When generating a DDM for one of the IMS file types, the following fields are included:

For all file types (I, J, K)

- KEY fields from the higher level IMS segments
- KEY fields from the current IMS segment
- KEY fields from the lower level IMS segment if data is accessed via an AIX index

Additionally for IMS Segments (file type I)

- user-defined fields of all IMS segment layouts (file type J)
- user-defined fields of the related logical child or logical parent segment

IMS Segment (file type J)

- user-defined fields of the named IMS segment layout
- user-defined fields of the related logical child or logical parent segment

IMS userview (file type K)

- user-defined fields of the named IMS User View file
- user-defined fields of the related logical child or logical parent segment

Generating DDMs for Use with SQL

Please note the following when generating DDMs for SQL file types:

- Parameter Truncate creator only applies when generating DDMs for the file types listed below.
- Natural synonyms and parameter Field name prefix are ignored for these file types.

SQL file types are

SQL File Types	
A(SQL)	Adabas (with SQL usage set to Y)
AT	Adabas table cluster
B	Adabas SQL view
BT	Adabas D table
BV	Adabas D view
D	DB2 table
E	DB2 view
JT	INGRES table
JV	INGRES view
OT	ORACLE table
OV	ORACLE view
X	General SQL file
XT	INFORMIX table
XV	INFORMIX view
YT	SYBASE table
YV	SYBASE view

Generating a DDM for Use with Adabas Vista

Prerequisites

If an Vista access number is used for generating a DDM, the virtual machine of the Vista element used for generation must be linked to the current network.

Changing the Current VM and Current Network is described under Miscellaneous in the **Predict Administration documentation**.

Recommendations when Using Adabas Vista

If using Predict with Adabas Vista distributed data processing, we recommend the following:

- Always enter Vista access numbers for Adabas files and userviews (Add, Modify file).
- Set the parameter Specification DB ID in the Modify DDM defaults screen to D (database ID may not be specified when generating a DDM from an Adabas file/userview) or to N (database ID may be specified but is not mandatory).
  If this parameter is set to Y, the user is forced to enter a database ID when generating a DDM from an Adabas file/userview.
- Set the parameter Use Vista access-nr in the Modify DDM defaults screen to T, but do not protect the field.
- Do not enter a database ID with the function Generate a DDM. This ensures the Vista access number is used for generation.

If you do not want to use Adabas Vista:

- Set the parameter Use Vista access-nr in the Modify DDM defaults screen to N and deactivate the option by blanking out the preceding X.

The table below illustrates the use of the parameter Use Vista access-nr.

Meaning of Parameter Use Vista access-nr

Specification DB ID	Use Vista Access-Nr	Database ID specified	Result
D,N	N	no	DDM is generated with DB ID=0
D,N	Y	no	If the file does not contain Vista access numbers, an error message is given. If the file contains Vista access numbers, a DDM is generated with the access numbers taken from the file.
D,N	T	no	If the file does not contain Vista access numbers, an error message is given. If the file contains Vista access numbers, the system tests whether a Vista element with the same numbers exists for this file. If so, a DDM is generated with this access numbers.
N,Y	N	yes	[1] If the file is not defined as partitioned in this database and the Adabas attribute Vista access only is not set to Y: the DDM is generated with the physical database number and physical file number (defined with file maintenance function Modify Adabas attributes).
N,Y	N	yes	[2] If the file is defined as partitioned in this database or the Adabas attribute Vista access only=Y: the system checks whether a Vista element for this file and database exists. If exactly one element exists, the DDM is generated with the Vista numbers defined in this Vista element. If more than one Vista element is found, no DDM is generated and an error message is given.
N,Y	T,Y	yes	Same as above, except that if several Vista elements exist for the file and database, the system checks whether the Vista access numbers of the file are identical to the Vista numbers of one of these Vista elements. If identical, the DDM is generated. If not, no DDM is generated and an error message is given.

Generate DDM in Batch Mode

Command: GENERATE DDM

Enter parameters on next line in positional or keyword form. File ID is obligatory, all other parameters are optional. If a parameter is not specified, the default value is taken.

Field	Keyword	Position
File ID	FILE-ID	1
Database ID	DATABASE-ID	2
Overwrite option	REPLACE	3
Field name prefix	PREFIX	4
Line comments	LINE-COM	5
General comments	GENERAL-COM	6
Abstract	SHORT-COM	7
List generated code	LIST	8
Generate verif. rules	GENERATE-RULE	9
Replace verif. rules	REPLACE-RULE	10
List verif. rules	LIST-RULE	11
Generate UDFs	GENERATE-UDF	12
Replace UDFs	REPLACE-UDF	13
List UDFs	LIST-UDF	14
Adabas version	ADA-VER	15
Truncate creator	TRUNC-CREATOR	16
IMS field suffix	IMS-SUFFIX	17
Use Vista access nr.	USE-ACCESS-NR	18

Note:
When generating a DDM in batch mode for database 0, DATABASE-ID must be set to blank and at least one other parameter must be specified in order that this parameter is recognized. For example:

```
GENERATE DDM
FILE-ID=FILE1,DATABASE-ID= ,LIST=Y
```

or in positional form:

```
GENERATE DDM
FILE1, ,,,,,,LIST=Y
```

Sample Output

```
13:19:05            *****  P R E D I C T  4.2.2   *****            2002-07-31
                             - Generate a DDM -                     Page:   1

       DBID: 180  FNR: 171  DDM: GENERATION-EXAMPLE              DEF.SEQ:

T L  DB  NAME                            F LENG  S D REMARKS
- -  --  ------------------------------- - ----- - - ----------------------
*    Generation started
*    at 2002-07-31 13:19:05
*    by user MSZ
*
*
*   EXAMPLE FILE FOR THE
*               GENERATION SUBSYSTEM
*
G 1  AA  GROUP-1
  2  AB  ELE-N-9V5                     N 9.5   N
         HD=ELE/HEADER

   VER:  GEN-CHECK-ZERO

G 2  AC  GR-IN-GROUP
  3  AD  ELE-B-4                       B 4.0   F D

   VER:  GEN-VER-EXAM

  3  AE  ELE-PS-5V2                    P 5.2   N

   VER:  GEN-CHECK-ZERO

*   MU field in group redefined two
*   times
M 3  AF  MU-B-4                       B 4.0   N
  2  AG  ELE-A-42                      A 42.0  N

   VER:  GEN-CHECK-BLANK
   VER:  GEN-VER-EXAM

  2  AH  ELE-F-8                       F 8.0   F
  2  AI  ELE-B-3                       B 3.0   N
*   Superfield and superdescriptor
  1  AJ  SB-ELE-A-5                    A 5.0   N
*        -------- SOURCE FIELD(S) -------
*        ELE-A-42(10-14)
```



```
13:19:05            *****  P R E D I C T  4.2.2   *****            2002-07-31
                             - Generate a DDM -                     Page:   2

       DBID: 180  FNR: 171  DDM: GENERATION-EXAMPLE              DEF.SEQ:

T L  DB  NAME                            F LENG  S D REMARKS
- -  --  ------------------------------- - ----- - - ----------------------

  1  S1  SP-DE-A-24                      A 24.0  N S
*        -------- SOURCE FIELD(S) -------
*        ELE-B-3(1-3)
*        ELE-A-42(20-36)
*        ELE-PS-5V2(1-4)
*
*   PE-group with automatic counter
*
P 1  AL  PC-OCC-7
  2  AM  PC-ELE-DE-NS-7V3                N 7.3   N D
*   counter for MU-field in PE-group
M 2  AN  PC-MC-PS-6V1                   P 6.1   N D

   VER:  GEN-CHECK-ZERO

*
G 2  AO  PC-GR
  3  AP  PC-ELE-I-2                      B 2.0   F
Format 'INTEGER' changed to 'BINARY'.
  3  AQ  PC-PS-20V7                      P 20.7  N
  2  AR  PC-ELE-F-4                      F 4.0   F
*   Formats: date,time,logical
  1  AS  ELE-D                           D 6.0   N
  1  AT  ELE-T                           T 12.0  N
  1  AU  ELE-L                           L 1.0   N
*   Hyperdescriptor with MU field
*   and source field of a PE-group
M 1  S2  HQ-DE-I-4                       I 4.0     H
*        -------- SOURCE FIELD(S) -------
*        PC-ELE-I-2
*        MU-B-4
***** DDM replaced *****
```