TUTKA Data Management System Rev. 2002

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ABSTRACT

Posiva Oy carries out site characterization program for the construction of deep geological disposal for the spent nuclear fuel. In May 2001 the Finnish Parliament made the Decision in Principle, which enables Posiva to proceed with the detailed level investigation aiming for the application of the construction license at the Olkiluoto site. The results of the site investigations carried out at Olkiluoto since 1987, as well as on five other sites have been stored in the digital data archive, TUTKA. Systematic archiving of the field measurement data has been done since the beginning of the site investigations. The present system TUTKA was taken in use 1992 by first transferring the older data to the system and in fully operational use in 1994. The program has been revised several times since. This report describes the current data management system and the latest revision of the TUTKA-software used for archiving the data.

Keywords: Data management, database, site investigations, spent nuclear fuel

TIIVISTELMÄ

Posiva Oy tekee paikkatutkimuksia käytetyn ydinpolttoaineen loppusijoittamiseksi kallioperään. Toukokuussa 2001 Suomen eduskunta teki periaatepäätöksen, jonka perusteella Posiva Oy voi tehdä yksityiskohtaisia, rakennusluvan hakuun tähtääviä paikkatutkimuksia Olkiluodon alueella. Olkiluodon alueella, samoin kuin muillakin alueilla vuodesta 1987 lähtien tehtyjen paikkatutkimusten tulokset on tallennettu digitaaliseen arkistointijärjestelmään, TUTKAan. Tutkimustietojen järjestelmällinen tallentaminen alkoi jo paikkatutkimuksien alkuvaiheessa. Nykyinen TUTKA-järjestelmä otettiin käyttöön vuonna 1992 siirtämällä ensin aiempien tutkimusten tulokset järjestelmään ja vuonna 1994 aloitettiin tulosten tallentaminen järjestelmään välittömästi tutkimuksen valmistuttua. Ohjelmaa on päivitetty useaan kertaan sen jälkeen. Tässä raportissa kuvataan nykyiset tiedonhallintaan liittyvät käytännöt samoin kuin TUTKA-ohjelman viimeisin ohjelmapäivitys.

Avainsanat: Tiedonhallinta, tietokanta, paikkatutkimukset, käytetty ydinpolttoaine

PREFACE

This work has been done under Posiva's commissions 9515/04/HH (JP-Fintact Oy) and 9563/04/HH (Rollcon Oy). Heikki Hinkkanen has been the contact person of the commission. TUTKA has been in operation since 1992 and during the years the operation and the development of the system has been co-ordinated by a project group. During the recent year the members of the TUTKA project team have been Esko Rauta and Juhani Palmu (TVO), Heikki Hinkkanen and Sanna Riikonen (Posiva Oy), Tomas Lehtimäki (JP-Fintact Oy) and the authors. TUTKA -data management system has been operated by JP-Fintact Oy. Ismo Lallo (Rollcon Oy) has been responsible for the software development.

This report is compiled by Pirjo Hellä. Ismo Lallo has provided the parts concerning the TUTKA-program itself. Comments by Tomas Lehtimäki and Eveliina Tammisto (JP-Fintact Oy) have clarified the text and the manuals presented in the Appendices in a remarkable way.

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1   INTRODUCTION

TUTKA database is an archive of the field investigation data collected during the site investigation programme carried out for the disposal of the nuclear fuel waste by Posiva Oy. Data from investigations done by Posiva or by the contractors is systematically gathered and quality controlled before entering it into the database. For the further interpretation and modelling work data can be retrieved from the TUTKA database. The TUTKA database is a Microsoft Access based meta database containing information on and reference to the actual data, which is stored separately. The abstracts of the Working reports and the POSIVA reports are also stored in the database. Backup procedures are defined. A project group is managing the operation and development of the TUTKA database and a number of Posiva's working instructions have been published to inform the parties producing, archiving and using data on their responsibilities and duties.

Posiva and formerly Teollisuuden Voima TVO have applied a systematic data gathering process ever since the beginning of the site investigations in 1987. At the beginning, there was a database of the data description files, but the measurement data was stored on the original diskettes, tapes etc delivered by the contractors. In 1992 the database application was replaced by MSAccess database, TUTKA, and the original data was saved in a uniform format on magneto-optical disks.

Since 1994 the TUTKA database has been in active use, revisions of the software have been done in 1997 (Lallo & Hellä 1997) and 2000-2003. The basic concept of archiving the data hasn't changed much. There is a database to store key information, description and reference to actual measurement data. The data itself is saved on separate data folders which are linked to the database. In addition, backup, version management and data retrieval procedures have been developed according to the needs of a wider use of the system, increase in data amount, correspondingly increased need of storage capacity and advances in computer technology.

At the time, field investigation data from all the investigated sites, Kuhmo Hyrynsalmi, Äänekoski, Sievi, Eurajoki and Loviisa can be found in the database. In 2001 the Finnish Parliament made the Decision in Principle according to which Olkiluoto, Eurajoki was selected to the site for disposal facility. Since then the studies have concentrated on the Olkiluoto Island. Hästholmen, Loviisa is still considered as a reserve site should the continuing investigation bring out something that would hinder the building of the disposal facility at the Olkiluoto. Therefore the archiving requirements for the Hästholmen data are the same as for the Olkiluoto data, although new data from the site is not collected at the moment.

This report describes the TUTKA-software used for the management of the investigation data and also the related working procedures at their current stage. New challenges also in the field of data management are faced as the building of the underground research facility ONKALO is about to start. As the construction work comes along with the investigation and research work, new parties are involved, faster data exchange between the different parties will be needed, more interaction and better integration of the data archive and other applications is needed and the amount and diversity of data will inevitably increase. All this together with the long time span of the disposal project contribute to the need of constant development of the data management system.

2   GENERAL ABOUT TUTKA

TUTKA software is used to store the results of the investigations either on the field or any interpretations, modelling and analysis work done within the characterisation project. The TUTKA system is an MSAccess based application consisting of three databases and the data folders linked to the database. The databases are

- the actual database TutkaDat.mdb,

- the program database Tutka2000_1.2.mdb and

- the parameter database Tutka_Param.mdb.

TUTKA is developed specially for archiving the data produced by the site characterisation program. Ismo Lallo from Rollcon Oy has done the programming work.

The major functions of the database are:

- Storing data

- Version management of the data

- Browsing and retrieving data

- Storing abstracts

- Browsing report abstracts

JP-Fintact Oy is taking care of the operation of the TUTKA-system, data input and retrieval and backup procedures. Posiva Oy has a copy of the databases and the data folders installed on their internal server. The database at Posiva is frequently updated by JP-Fintact. Additionally, single data folders or even the whole database can be delivered to third parties on permission by Posiva. For example, Radiation and Nuclear Safety Authority (STUK) has also a copy of the database and data, which is updated twice a year. Figure 2-1 shows the main functions of the TUTKA data management system and the data flow through the system.
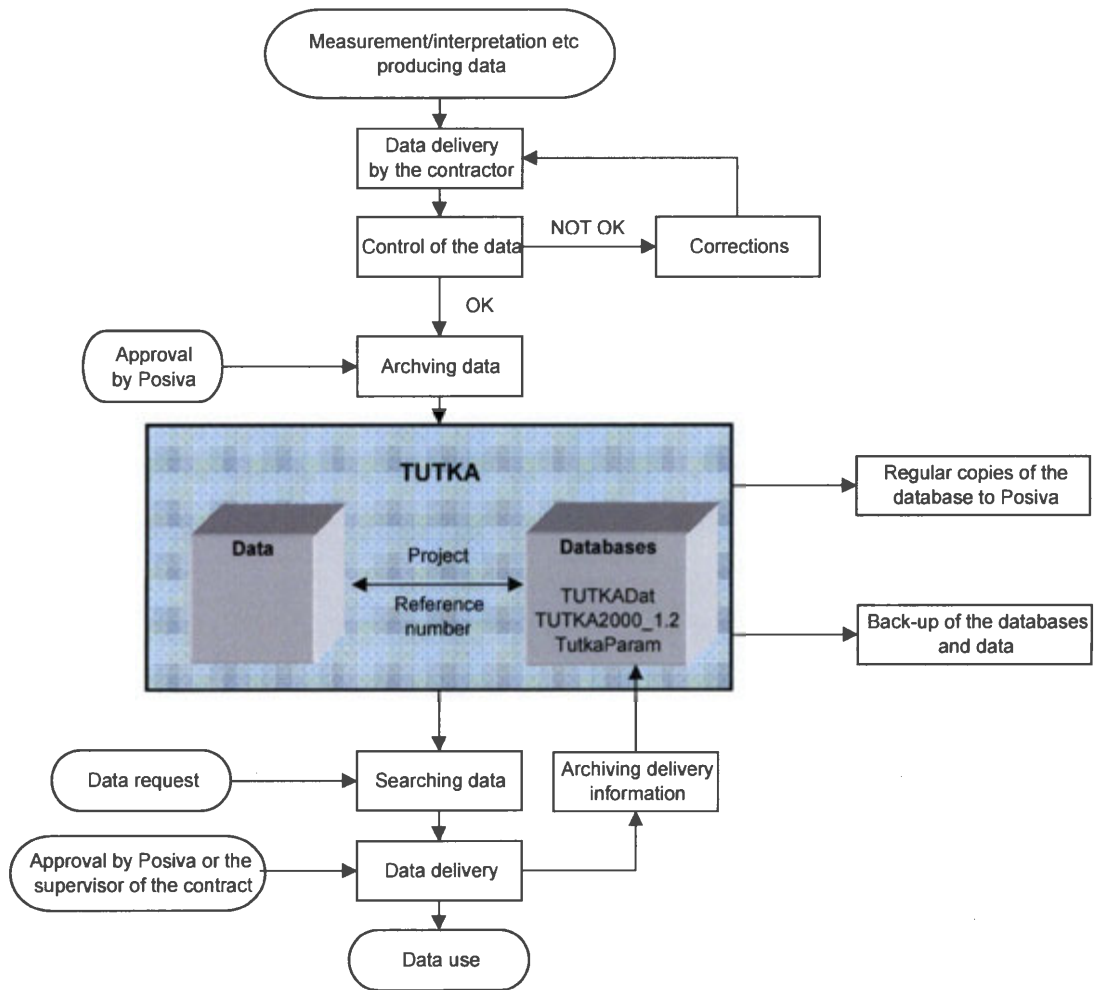
Figure 2-1. *Data flow in the TUTKA data management system.*

3 HARDWARE

3.1 Computers

TUTKA is running on a PC with Windows2000 or Windows XP operating system running MSAccess 2000 or MSAccess 2002. About 10 Mb hard disk space is needed for the program databases, the memory requirements of actual database and the data folders depends on the amount data. The amount of data that can be archived is limited basically only by the storage capacity as the files are stored separately. Currently (spring 2004), their sizes are in Posiva's application 50 Mb for the database and 11.5 Gb for the data folders (including all six investigation sites, Olkiluoto data folders are currently just below 4 Gb). It is also possible to install the TUTKA databases on a server and use them in a local area network.

3.2 Media

The contractors deliver the data to be archived in TUTKA on diskettes (DOS-format, 3.5" 1.44 Mb (DS, HD) or more frequently on CD-R disks (650 Mb, 74 min). If the amount of data is very high, other media (e.g. tapes or DVDs) can be used. The exceptions should be agreed with Posiva.

As part of the archive process, the data folders are stored on computer's hard disk. In the computer at JP-Fintact, which is used to archive the data and contains the original database, the data is stored on two physically different hard disks to minimise the risk on data loss due to possible disk errors.

For backups CD-R-disks (650 Mb, 74 min) and DLT-tapes are used. During the recent years also DVDs are taken in use in some special cases, when the amount of data is high.

DLT-tapes are used for back-ups and also to store data files which are not stored on hard disks because of their size.

4   SOFTWARE

TUTKA-software is described in detail in Appendix 1 and its user manual can be found in Appendix 3. Functions of the software and related working procedures are described in chapter 6. In the following the revised and new features added to the software since the last reporting in 1997 (Lallo & Hellä 1997) are shortly presented. The revised and new features have aimed to ease the use of the TUTKA-software and thereby minimise risk of errors, answer the demands on requirements of faster archiving of data, controlled data flow and international use. The programming work has been done by Ismo Lallo, Rollcon Oy, and Tomas Lehtimäki and Pirjo Hellä have been testing the program revisions.

The major revisions are presented below:

- The TUTKA program is divided in three databases:

    o the actual database TutkaDat.mdb containing tables for the metadata (keywords) of the investigation data, description files, abstracts of the reports both in Finnish and in English, metadata about the reports, the path to the actual data folder and the data version information,

    o the program database Tutka2000_1.2.mdb containing the program modules, tables for the allowed keywords, texts to be shown in the windows and messages enabling English and Finnish version of the program and

    o the parameter database Tutka_Param.mdb, which contains user identification and user right settings, program settings, sort order settings and a table for the information about the delivered data from TUTKA.

- User management

    o Earlier browsing the database didn't require user identification. This has been changed so that the program user identification is always required also for browsing the database not only for archiving data. Identification of single users can be skipped in case the user rights are defined by the organisation e.g. Posiva.

    o The functionality of the TUTKA –program depends on the rights given to the user or the organisation using TUTKA. Users can have different rights which enable them to browse only the database or to browse the database and also the data or part of it or to archive and deliver data or administer the user rights. User management has been made easy to handle by adding a special user right management function.

- Description files in English, it is now possible to archive data which description files in English are attached to.

- Sort order of the search results can now be selected by the user. The search results can be sorted by keywords in any order. This feature helps the user in browsing the search results and especially in selecting the data for delivery.

- Archiving draft version data has been added to enable faster archiving of the field measurement data and a better control of its use. Earlier data was archived first after the report was published; this had as a result an uncontrolled use of possibly different draft versions by various users for e.g. planning of the new investigations.

- Information on the data deliveries from the database is now archived in a separate data table. Earlier such an archive was kept manually.

- The folder structure of the data folders was revised by adding project folders under the site sub folders (see chapter 5.2). By this way contradictions in storing new versions of data from earlier projects were avoided. The reference number of data can be same in different projects (SITU/PATU/PARVI/OIVA) and the unique key to the data is actually project **and** the reference number.

- Separate browser (Access runtime) and archive versions of the TUTKA-software are not needed anymore as MSAccess has become common software and by the user right management the user rights can be set.

5   DATA

5.1   Data stored in TUTKA

The data which is stored in TUTKA includes results from the geological, geophysical, hydrological, geochemical and geotechnical field surveys and borehole investigations. Various interpretation, analysis and modelling results are also archived, but not with as good coverage. In principle, the data is stored in a form that can be used in further interpretation and modelling work and on the other hand in a form that can be reprocessed if necessary. Reprocessing of the data is sometimes needed because new and better processing techniques become later available or more accurate results (e.g. better depth resolution) can be obtained or errors corrected by reprocessing. The original measurement files are not always stored, but recent experiences have shown that this should always be done as the reprocessing can otherwise be impossible.

5.2   Organising data

The investigation data is stored in a particular directory structure of the Datat sub-directory of the TUTKA-project directory (see Figure 5-1). There is a folder for different sites. Folder Muualue is used to store data from the sites discarded in 1993 and from the sites, which are not characterised for the disposal facility, but on which test studies are made. Under the site folder a number of subfolders are created. The size of these subfolders is restricted to be 580 Mb or less. This ensures that the contents of each subfolder can be copied to a CD-disk in the backup procedure (see chapter 6.5). TUTKA program automatically checks the size of the files and folders to be archived and informs the user when a new subfolder has to be created. Under the subfolders are the project folders (SITU/PATU/PARVI/OIVA) and under them the data folders containing the actual data files and the corresponding description file.

Each data folder contains a description file. The description file is filled by the contractor delivering the data. It contains keywords of the data in the beginning and description of the data contents, which should be described in such a detail, that it can be further used even after years. The description file should contain information on the equipment used, processing of data, measurement intervals etc and description of each of the columns of the data files, explanation of the abbreviations and units etc.

The contractors deliver the field measurement data and its description file organised in folders. These folders will be come data folders of the TUTKA system after archiving. Each folder contains files, which are described by the same keywords in the description file named. When the data is archived in TUTKA the keywords in the description file are checked and stored to the database together with some additional information (report number, archive data etc) and the description file itself. A new data folder is created to the current subfolder under appropriate project folder and the data files are copied into it. The new data folder is named after the reference number of the data given by the system.
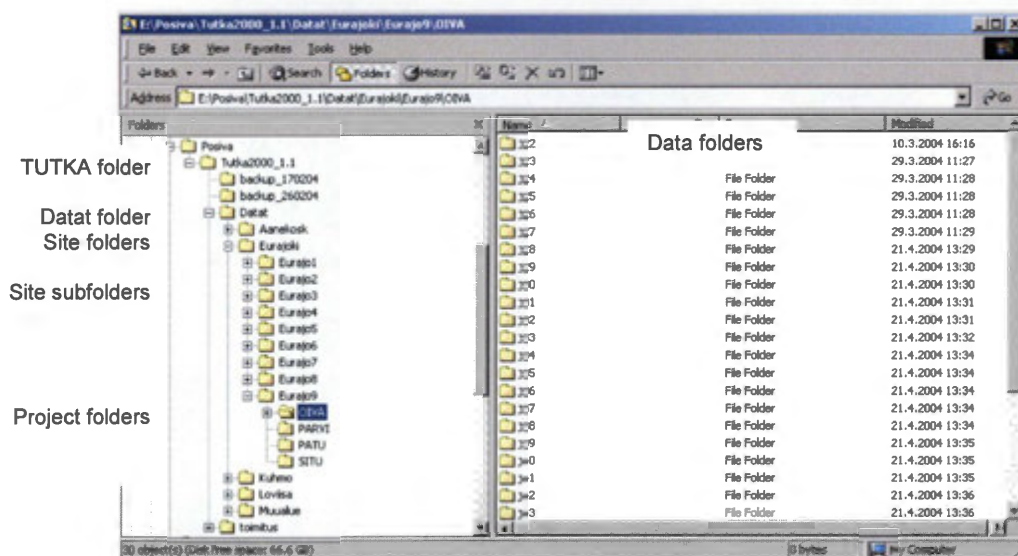
Figure 5-1. *Data folders in TUTKA data archive. The data folders contain the actual data files and a description file kuvaus.txt including the key information of the data and describing the contents of the data.*

5.3 Data formats

The files are stored mainly as Windows ANSI – txt-files. This file type has been selected because it is program and software independent and therefore it is likely to remain usable for a long time. All measurement data can't be or is not applicable to store in text format. Therefore also other file types are accepted on special agreement. These are mainly common image files (gif/jpg/bmp) or binary, raw measurement files, which are used as input in the processing or modelling software. In some cases a Viewer or Reader program is available and the data can be delivered accompanied with the Viewer or Reader program. The functionality of such programs should be tested from time to time as the programs do not necessary work in computers with another operating system. An example of this is borehole images (BIP). All this data is not stored in the data folders commonly used, because of the huge size of the files. Instead the data is stored on tapes and disks used for backups and backups of these separate disks and tapes are taken according to normal back up procedure. Anyhow, a description file containing a reference to the data files and the keywords along with the report abstracts are stored normally and can be used to search data in the database.

6 WORKING PRACTICES

6.1 Delivering data to the TUTKA archive

The contractors deliver the field investigation results in a digital format as agreed in the contract. Demanded format and media of the data are described in Posiva's work instructions, which are usually appended in the purchase order. As the last payment of the contract is due only after accepted data delivery, there have not been any great difficulties in getting the data.

Normally the data is delivered for archiving after the data and the report have been approved by Posiva. Anyhow, some data is needed soon after it has been measured for planning of other investigations etc. This data includes for example drilling results and mappings from the core sample, standard geophysical measurements, flow logging results and borehole wall images. Therefore draft versions of this data are also delivered to TUTKA as soon as possible. This data is stored in TUTKA with draft-status and can be then delivered from TUTKA in a controlled way for those who need the data.

6.2 Controlling and archiving data

Basically the draft versions of data are not controlled thoroughly, they often come to TUTKA through Posiva's representative or an expert consult supervising the contract and they have done preliminary checks of the data. The final versions of data are controlled, although due to the amount of data only spot checks to the data files are possible. Controlling the delivered data is done in co-operation between JP-Fintact operating the database, supervisor of the commission and contact person at Posiva. JP-Fintact prepares a report of the delivered data and the controls carried out. This report is presented to Posiva's representative, who approves the data delivery.

Prior to delivery, the final data has already gone through many controls by the contractor and the supervisors of the project. Data control before archiving the data in TUTKA includes checking that the data is in accepted formats, appropriately organised and described in the description files. Also the report abstract both in Finnish and in English should be delivered for archiving in TUTKA. The delivered final data must be the one presented in the report; comparisons are made before archiving the data. It is also checked that all measurement lines, boreholes and intervals are included, that the value range is appropriate and that all the processing stages of the data are delivered as agreed.

If there are errors or deficiencies in the data delivery either in the data files or in the data description the contractor is asked to supply corrected files and description before the data is archived. When archiving data, the keywords are checked, a reference number and information on who did the archiving and when is attached to the data (see Figure 6-1.). The data is stored in a data folder named with the reference numberadded automatically. The reference, keywords, description form and abstract both in Finnish and in English of the corresponding report are stored in the database.

Figure 6-1. *Window showing the checked keywords and size of the data to be archived.*

6.3   Version management of data

Anyhow, every now and then errors in the data are noticed after it has been archived. Typically errors are noticed when it is used for further analysis together with some other data. Sometimes needs for reprocessing of the data emerge first after years, when for example new techniques become available. TUTKA-database contains version management feature, where the new data can be archived as a new version of an older data. The older data to be replaced is not deleted from the archive. As the database also contains a list of the data deliveries it is also easy to check who has used the older erroneous data and inform them if still appropriate. Naturally, also Posiva and the contractor are immediately informed, when an error is noticed. Posiva has to accept any actions that are to be made to correct the errors. Usually, the contractor is asked to deliver a new corrected version of the data, which is stored and a link between the different versions of the data is established. The incorrect version is marked with a note that it should not be further used. In the description file attached to the new version of data, the reason for correction is described. Otherwise the new version of data is archived as any data. The TUTKA-browser shows if there are several versions of the data and it is possible to exclude out-of-date versions of data from the search.

6.4 Browsing data and abstracts

Data can be search from the TUTKA database by using the browser window. Depending on the rights of the user, the user can browse the database i.e. the key information and description files of data and abstracts or browse the database and data files or also retrieve data from the database. The user rights affect also whether the user can see draft versions of data.

Data can be searched by any selected keyword combination (see Figure 6-2.). The search results can be sorted by selected order of keywords. The user can also browse through different versions of data.

There is a separate window to browse the report abstracts (see Figure 6-3.). The abstracts can also be browsed by giving keywords or any text that is searched within the values of certain fields, e.g. title of the report or authors.

Figure 6-2. *Window to browse the data archive.*

Figure 6-3. *Window to browse report abstracts.*

6.5 Delivering data from the TUTKA archive

Data is retrieved from the database for further use in planning of investigations, interpretation and modelling work. Any deliveries of data have to be agreed with Posiva either case by case or as part of a commission. In the latter case, the supervisor of the contract can approve the data delivery. The parameter database contains a table to archive data deliveries. In addition to the key information of the delivered data, also delivery information to whom data is delivered, by whom the delivery is approved, by whom it is delivered, delivery date, and purpose of the delivery are recorded. The delivery functions are available in the Data archive window in case the user has the proper rights.

Copies of the database or the database and the data or part of it can also be delivered. These deliveries must always be approved by Posiva. Posiva has a copy of the database for internal use which is frequently updated. Also, both the database and the data are delivered to Radiation and Nuclear Safety Authority Finland (STUK) and the database in their use is updated on a regular basis. In the Login window (if it is used) and in the Menu window of TUTKA the date when the archive was updated is shown.

6.6 Data security

The field investigation data forms a basis for all the subsequent interpretation and modelling work. A lot of effort, time and money have been spent to collect the data, which can even be impossible to measure again. So, the data is of great value and should stay usable for a long period of time. Unauthorised use of the data is also to be avoided. Therefore special attention has been paid in data security and backup procedures.

To prevent unauthorised use of the data, the TUTKA-database has the user management features and Posiva has given instructions concerning data deliveries and

storing the disks and tapes containing TUTKA data. To ensure that no data is lost or become unreadable the data is stored on two different media e.g. hard disk and tape or CD-disk and tape. Copies of the data are stored in geographically different places to minimise the risk of data loss. The data is also read from the archive disks and tapes on a regular basis to ensure that they are still readable. Use of a limited tape and disk types enhances the possibilities to keep the data in readable format and easies the transfer to the new media which is inevitable during the time span of the disposal project. The long time span also is a motivation for a proper documentation of the data as well as the people and organisations involved will also change.

The backup procedures are presented in Figure 6-4. The figure shows the principles of using different media (disks, tapes etc) and storing the data in different places.
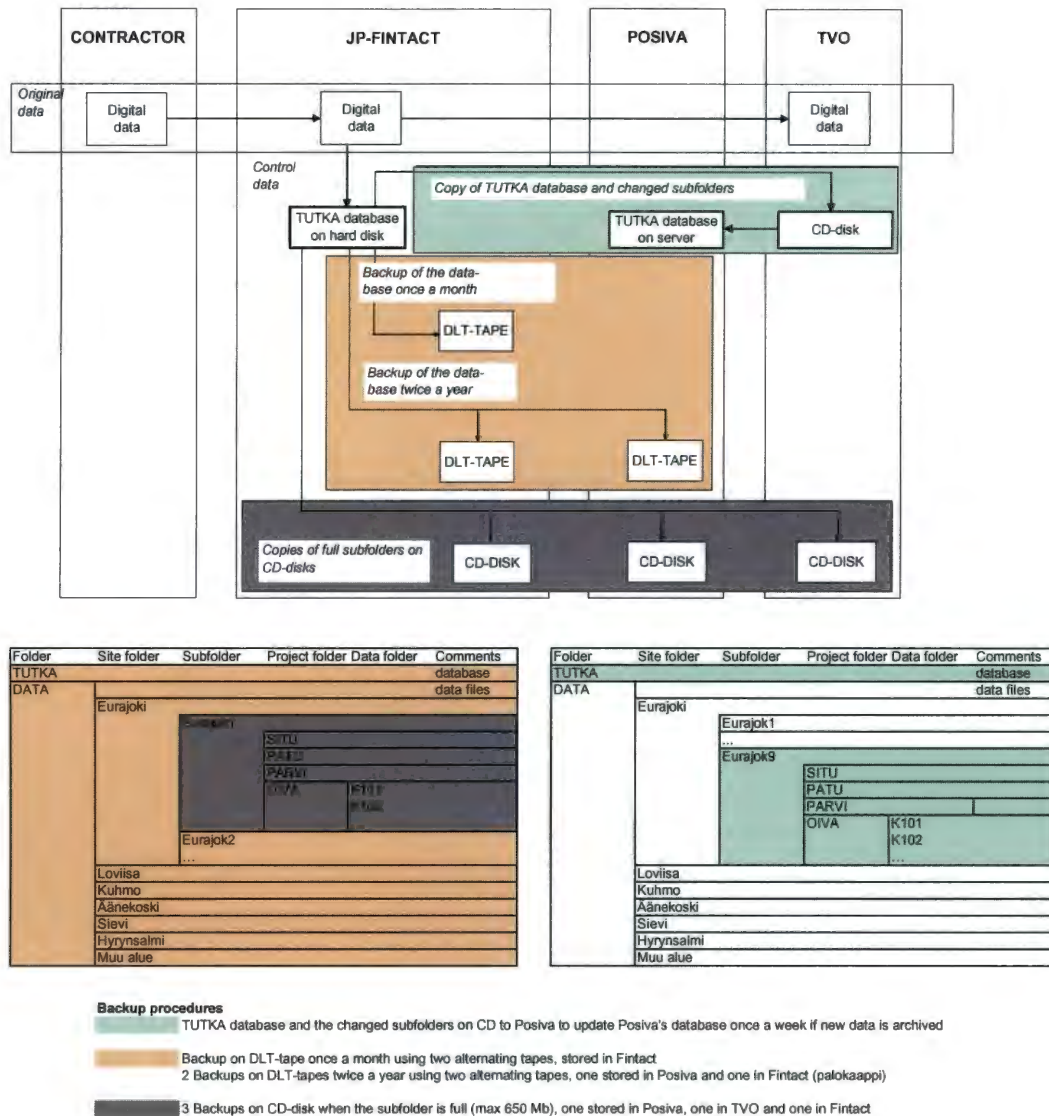
Figure 6-4. *Data flow and backup procedure of the TUTKA database.*

7   DISCUSSION

When the TUTKA database was launched in the early nineties, the goal was to establish a simple database and data management protocol. The system was built to meet primarily the needs of storing and archiving data. Anyhow, during the years the data retrieval has become more and more important and many later revisions of the system have been aimed to enhance the data retrieval and usability. The used to be data archive has turned out to be a central data storage, which has enabled a controlled data flow from the field to further analysis. New challenges on the improved usability of data, wider use of the data and faster data flow are faced in the near future, when Posiva starts construction of the underground research facility ONKALO (see Posiva 2003). Inevitably also the data amount will increase in the future as the development of the investigation techniques tends to produce increasing amounts of data all the time.

Even tough new challenges are to be met the motivation for the data management has not and is not likely to change. Data is valuable as its acquisition is often expensive and it is not even possible to redo all measurements. Data is used during a long period of time in the spent fuel disposal project. Although data management also costs, time and money is saved, when people know where to search data and the contents of the data. The basic requirements on the data management system will hardly be changed by the future challenges either. The data should be stored in a form that is reusable and reprocessable; data flow in the system and between organisations should be controlled. Proper documentation of the data is of uttermost importance. Flexibility is needed, as along time the amount of data increases, data in new formats has to archived, the computer systems and software change. This means that from time to time the data archive has to be transferred to new types of disks and tapes etc. Then it is of great advantage to have all the data archived in one place and in rather uniform format. The tasks related to data management should be well organised and routinely done. All people involved either in controlling and archiving the data or providing or using data should acknowledge their role in data management and how they can help to improve the quality of data and especially think the needs of the other data users and documentation requirements rising from it.

The experiences gathered during the years have shown that it is important to be quick to get the data from the contractors. If any delays come it will get tedious to get the data. It is also important that the contractors acknowledge that the data delivery to the database is part of the contract from the very beginning. Also a simple and easy to use system is better than a complicated one. The delivery should be as simple as possible to ensure the delivery rather than a very complicated procedure, which the contractors can find to be even an obstacle for the delivery. The duties, tasks and responsibilities between the contractor and personnel involved in data archiving have to be clearly defined. Archiving files in non-application and non-software specific formats (text-format) has proven to be a very practical decision and enabled the use of data in different types of applications and in different types of computers during the years. Many of the data files from eighties are still in active use.

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APPENDICES

APPENDIX 1 PROGRAM DESCRIPTION

WINDOW DESCRIPTIONS

LOG IN to TUTKA (Fo_Login)

Main Menu (Fo_Valikko)

Browsing archived data (Fo_Kortisto)

Sort order for archived data (Fo_Sortti)
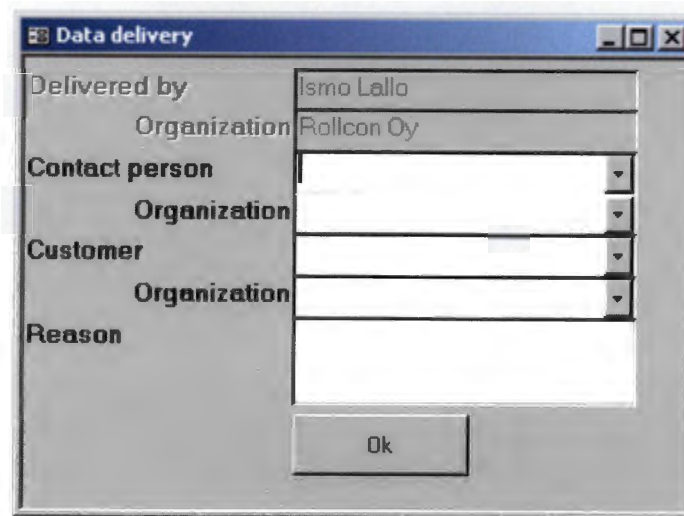
Delivery of archived data (Fo_Toimitus)
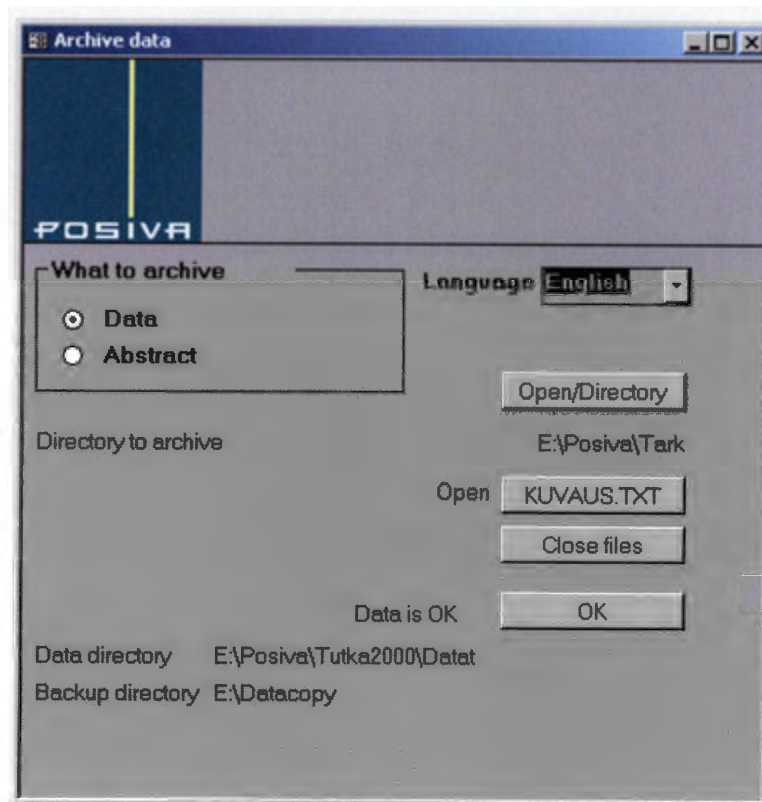
Archive data Menu (Fo_Tarkastus)

Select directory (Fo_Avaa_Valitse)
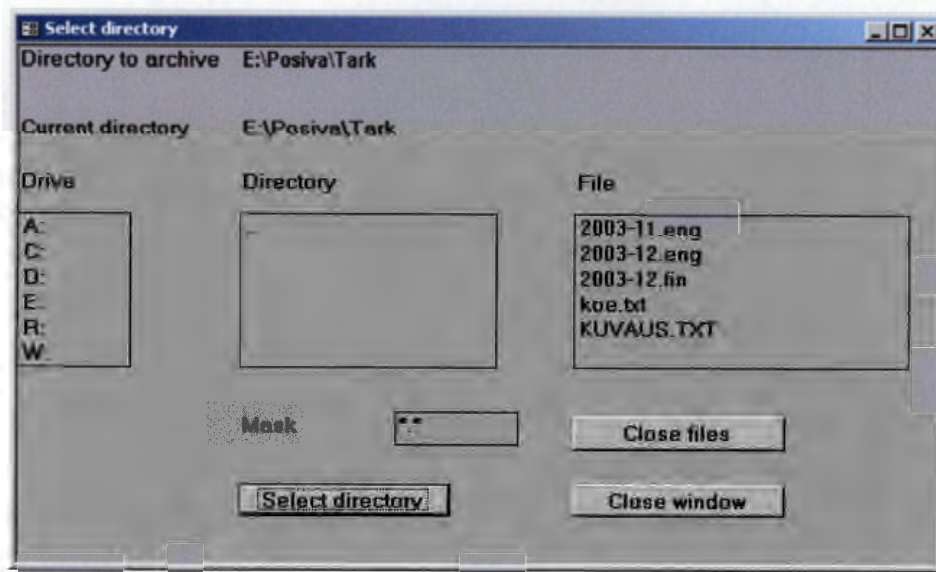
Change description (Fo_Muuta_Kuvaus)
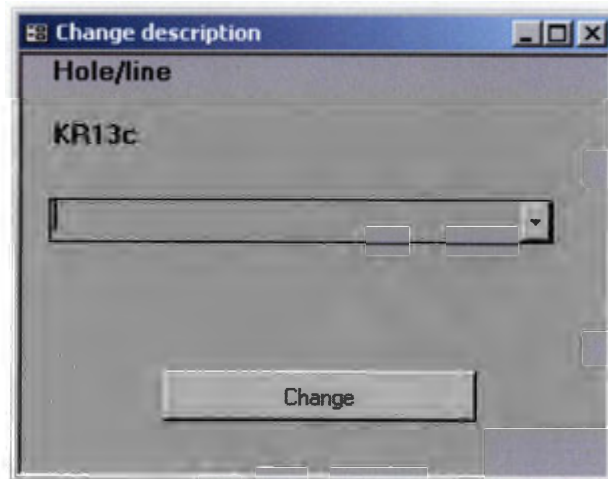
Show keywords (Fo_Nayta_Avaimet)

Version management (Fo_Versiot)

Add or change allowed keywords (Fo_Avaimet)

Archive abstracts (Fo_Tiivistelma)

User management (Fo_Kayttajat)

Report browsing (Fo_Raportit)

DESCRIPTION OF PROGRAM DATABASE (TUTKA2000_1.2.MDB)

Table for allowed keywords (Avainarvot)

This table contains allowed keywords for "kuvaus.txt" file delivered by the contractor.

Field Name	Data Type	Description
Avainnumero	Number	Key number
Teksti_Fin	Text	Allowed value in Finnish
Teksti_Eng	Text	Allowed value in English

Table for window texts (Formin_kentat)

This table contains all values for texts shown in program windows. Shown texts can be changed by using this table.

Field Name	Data Type	Description
Formi	Text	Name of the form
Kentta	Text	Name of the field
Kieli	Text	Language
Kentan_teksti	Text	Text to be displayed

Table for message boxes (Ilmoitus)

This table contains all values for texts displayed in message boxes or error messages. Texts can be changed by using this table.

Field Name	Data Type	Description
Avain	Text	Key value
Kieli	Text	Language
Teksti	Text	Text to be displayed

Table for allowed languages (Kielet)
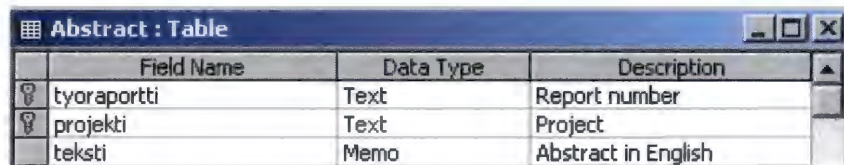
This table contains allowed languages accepted in this program.

Field Name	Data Type	Description
Kieli	Text	Name of the language

DESCRIPTION OF DATABASE (TUTKAdat.MDB)

Table for abstracts in English (Abstract)
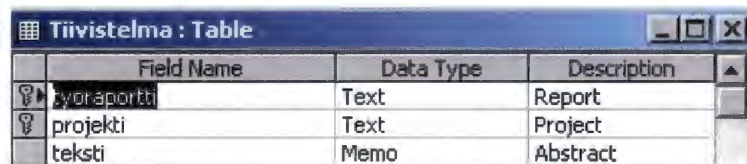
This table contains all abstracts in English.

Field Name	Data Type	Description
tyoraportti	Text	Report number
projekti	Text	Project
teksti	Memo	Abstract in English

Table for abstracts in Finnish (Tiivistelma)
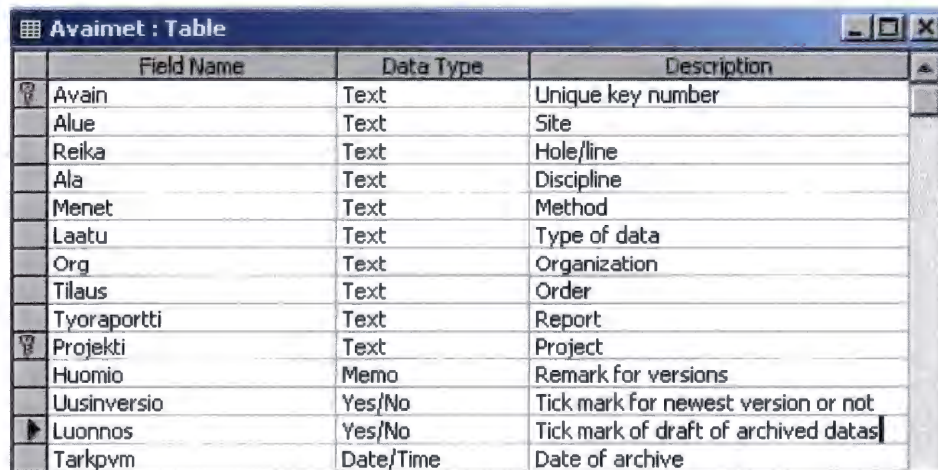
This table contains all abstracts in Finnish.

Field Name	Data Type	Description
tyoraportti	Text	Report
projekti	Text	Project
teksti	Memo	Abstract

Table for archived keywords in Finnish (Avaimet)

This table contains all archived records and their keywords in Finnish

Field Name	Data Type	Description
Avain	Text	Unique key number
Alue	Text	Site
Reika	Text	Hole/line
Ala	Text	Discipline
Menet	Text	Method
Laatu	Text	Type of data
Org	Text	Organization
Tilaus	Text	Order
Tyoraportti	Text	Report
Projekti	Text	Project
Huomio	Memo	Remark for versions
Uusinversio	Yes/No	Tick mark for newest version or not
Luonnos	Yes/No	Tick mark of draft of archived datas
Tarkpvm	Date/Time	Date of archive

Table for archived keywords in English (Avaimet_Eng)

This table contains all archived records and their keywords in English

Field Name	Data Type	Description
Avain	Text	Unique key number
Alue	Text	Site
Reika	Text	Hole/line
Ala	Text	Discipline
Menet	Text	Method
Laatu	Text	Type of data
Org	Text	Organization
Tilaus	Text	Order
Tyoraportti	Text	Report
Projekti	Text	Project
Huomio	Memo	Remark for versions
Uusinversio	Yes/No	Tick mark for newest version or not
Luonnos	Yes/No	Tick mark of draft of archived datas
Tarkpvm	Date/Time	Date of archive

Table for archived data descriptions in Finnish (Kuvaus)

This table contains all archived data descriptions in Finnish

Field Name	Data Type	Description
avain	Text	Unique key number
Projekti	Text	Project
teksti	Memo	Description on Finnish

Table for data paths (Polku)

This table contains path values to archived data

Field Name	Data Type	Description
DVD_levy	Text	Name in "nimi"-file
Kuvaus_hakemisto	Text	Directory name in "Kuvaus.txt"-file
DVD_hakemisto	Text	Actual directory name

Table for report identification (Raportit)

This table contains identification data of all archived reports

▦ Raportit : Table			_□×
Field Name	Data Type	Description	
Raporttinumero	Text	Report	
Projekti	Text	Project	
Nimieng	Text	Name in English	
Nimifin	Text	Name in Finnish	
Julkaisija	Text	Publisher	
Tyyppi	Text	Report type	
Kieli	Text	Language	
Julkaisuvuosi	Number	Year of publication of the report	
Sivuja	Number	Number of pages in the report	
Liitteita	Number	Number of appendices in the report	
ISBN	Text	ISBN-number	

Table for authors (Rap_tekijat)

This table contains all authors of archived reports

▦ Rap_tekijat : Table			_□×
Field Name	Data Type	Description	
Raporttinumero1	Text	Report	
Projekti1	Text	Project	
Tek_nro	Number	Author's index number	
Tekija	Text	Author	
Tek_org	Text	Author's organization	

Table for version management (Versiot)

This table contains all versions of archived data.

▦ Versiot : Table			_□×
Field Name	Data Type	Description	
ID	Number	Unique index for archived data	
Avain	Text	Key number to archived data	
Projekti	Text	Project	
Versio_Nro	Number	Version number	
Huomio	Memo	Remark	

DESCRIPTION OF PARAMETER DATABASE (TutkaParam.MDB)

Table for user management (Kayttajat)

This table contains user identification and user rights

Field Name	Data Type	Description
Organisaatio	Text	Usesr's organization
Nimi	Text	User's name
Kayttajatunnus	Text	User Id
Salasana	Text	User's password
Kieli	Text	User's languahe
Selaus	Yes/No	Tick mark to browse
Luonnos	Yes/No	Tick mark to see drafts
Datat	Yes/No	Tick mark to browse data
Toimitus	Yes/No	Tick mark to deliver data
Tarkastus	Yes/No	Tick mark to achieve data
Kayttajat	Yes/No	Tick mark to updata users

Table for parameters (Parametrit)

This table contains parameters for edit program and archiving

Avain	T_arvo	Kommentti
Abstract	*.eng	File mask for Abstract's (English)
Editori	c:\WINNT\NOTEPAD.EXE	Path for editor
Editori_Win	Notepad	How windows shows editor's name
Hakemisto	E:\Posiva\Tark	Default working directory for the data to be archived
Kieli	English	Last used language
Kuvaus	Kuvaus.TXT	Data description file
Projekti	OIVA	Default project name
Pvm	29.3.2004	Date of the last data archive
RW_Tila	580	How many megabytes is allowed to archive in one directory
Tiivistelma	*.fin	File mask for Abstract's (Finnish)
Toiminto	POSIVAz	Should be "POSIVA" for POSIVA users. STUK for STUK. No meaning for others
W_Asema	d:\Data	Data backup-folder for archieve
Win_nimi	tiedosto - ohjelma	How selected editor shows file names after opening. (kuvaus.txt - Notepad)

Table for sort order in browsing archived data (Sortti)

This table contains parameters for sorting order to browse archived data

Field Name	Data Type	Description
Avain	AutoNumber	
Rivi	Number	Row number
Kentta_fin	Text	Row name in Finnish
Kentta_eng	Text	Row name in English
Kentta_db	Text	Field's name in table

Table for data delivery (Toimitus)

This table contains information of delivered data folders

Field Name	Data Type	Description
Paaavain	AutoNumber	Unique key
Pvm	Date/Time	Date of delivery
Tarkastaja_nimi	Text	Delivered by (name)
Tarkastaja_yritys	Text	Delivered by (organization)
Lupaaja_nimi	Text	Contact person (name)
Lupaaja_yritys	Text	Contact person (organization)
Asiakas_nimi	Text	Customer (name)
Asiakas_yritys	Text	Customer (organization)
Avain	Text	Key number to archived data
Projekti	Text	Project
Alue	Text	Site
Reika	Text	Hole/line
Ala	Text	Discipline
Menet	Text	Method
Laatu	Text	Type of data
Tyoraportti	Text	Report
Polku	Text	Path to archived data
Syy	Text	Reason to deliver data

Table relations

PROGRAM MODULES (TUTKA2000_1.2.MDB, Modules)

Module name	Purpose
Globals	Global variables
Mod_Avaimet	
Mod_Avaa_Avain	Opens form Avaimet
Mod_Virhe_Avain	Opens form Muuta_Kuvaus
Mod_Avain_Arvot	Form's Avaimet list all keywords
Mod_File_Manager	
List_Dir	Shows subdirectories to selected directory in form "Avaa_Valitse"
List_Drive	Shows disk drives in form "Avaa_Valitse"
List_File	Shows files of selected directory in form "Avaa_Valitse"
Mod_Formit	
Mod_Form_Avaa_Valitse_Vaihda	Changes the directory where data is archived from
Mod_Form_Avaimet_Lista	Fetches files from directory to combobox
Mod_Form_Field_Values	Shows field texts from selected form
Mod_Form_Fields	Read field texts from database
Mod_Form_Open	Shows menu depending of language and user rights
Mod_Form_Tarkastus_Avaa_Tied	Calls subroutine, which opens files
Mod_Form_Tarkastus_Edit_Palkki	
	Updates "Open"-button to open "kuvaus.txt"or abstract files
Mod_Form_Tarkastus_Piilota	Hides Parameter-field from form Fo_Tarkastus
Mod_Form_Field_Values	Shows field texts from selected form
Mod_Ilmoitukset	
IL_Input_Parameter	Fetches value and text of the parameter to be changed
IL_InputBox	Fetches messages depending on selected language from table "Ilmoitus" and shows then in a Input-box
IL_MsgBox	Fetches messages depending on selected language from table "Ilmoitus" and shows then in a Message-box
Mod_Kysy_Avaimet	
arvot_cb	reads selectable values from database to form "Fo_kortisto"'s combo boxes
avaimet	shows selected values to form
Fo_kortisto	
Fo_kortisto_pb	push buttons in form Fo_kortisto
ps_k_avaimet_cb	reads archived data to current field

Module name	Purpose
Mod_Parametrit	
Mod_Parametrit_Abstract	Asks for a file mask to Abstract files
Mod_Parametrit_Hakemisto	Asks for a new directory for archive
Mod_Parametrit_Kuvaus	Asks for a file mask to "kuvaus"-files
Mod_Parametrit_Projekti	Asks for a new project
Mod_Sorttaus	
sort_jarjestys	handles the changes in table "Sortti"
Mod_Tarkastus	
Mod_Nayta_Kuvaus_Avaimet	Shows keywords from "kuvaus.txt" file
Mod_Tark_Lue_Kuvaus	Reads and checks keywords from file "kuvaus.txt"
Mod_Tarkasta	Checks "kuvaus.txt" delivered from a constructor
Mod_Versiot	
hae_kortisto_versio	Shows version data from newly selected data
hae_versionro	Fetches a new version number to currently archived data
kopioi_versio	copies version information from form Fo_Versiot to form Fo_Nayta_Avaimet
lisaa_versio	inserts a new version to table "Versiot"
nayta_kortisto_versio	fetches next or previous version of selected data to form "Fo_Kortisto"
tyhjenna_versio	clears values from form "Fo_Versiot"
Mod_Win_Kirjasto	DLL-library function calls
Mod_Yleiset	
closeapp	Sends Alt F4 to files opened from this program
Lataa_parametrit	Reads values from table "Parametrit" to global parameters
Mod_tyhja	Checks if string variable is empty
Mod_Yl_Avaa_Tiedosto	Opens a selected file with an editor described in table "Parametrit"
StartApp	Starts the program given in parameter string

POSIVA OY
Tutkimus

Asiakirjan nimi	Asiakirjatunnus	Sivu(t)
TYÖOHJE	TYÖ-O-02/02-REV1	1 (5)

Laatija(t)/Pvm	Tarkastajat/Pvm	Hyväksyjät/Pvm
Pirjo Hellä (JP-Fintact) & Sanna Riikonen /12.10.2004	Heikki Hinkkanen, Tarja Nurminen	Juhani Vira

DATA DELIVERY TO TUTKA-DATABASE

1 INTRODUCTION

TUTKA database is an archive of the digital field investigation data collected during the site investigation programme. Data from investigations carried out by Posiva or by the contractors is systematically gathered and quality controlled before archiving it into the database. For the further interpretation and modelling work, data can be retrieved from the TUTKA database.

The database is a Microsoft Access based meta database containing information on and reference to the actual data, which is stored separately. Backup procedures are defined. A project group is managing the operation and development of the TUTKA database.

2 OBJECTIVE

These instructions are given to ensure that the investigation data is delivered to TUTKA. All investigation data is to be delivered to TUTKA latest when the original of corresponding working report is sent to Posiva. This is called the final version of data. Some data is needed soon after it has been measured for planning of other investigations etc. This data includes for example drilling results and mappings from the core sample, standard geophysical measurements, flow logging results and borehole wall images. Therefore draft versions of this data are also delivered to TUTKA as soon as possible. The data can be then delivered from TUTKA in a controlled way for those who need the data.

When delivering the final version of data instructions here concerning the format and organizing of data are to be followed to ensure that the data is in a uniform format and easy to control and store in the database. The further use of the data requires that the data is both in adequate format and well documented. The format requirements do not apply to the draft versions of data, which can be sent as files.

3 SCOPE

These instructions are to be followed when delivering data to the TUTKA-database and by the persons involved in the data delivery, i.e.

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	POSIVA OY Tutkimus	Asiakirjan nimi TYÖOHJE	Asiakirjatunnus TYÖ-O-02/02-REV1	Sivu(t) 2 (5)

contractors, contact persons of the commission in question and persons responsible for controlling and archiving the data.

4 RESPONSIBILITIES

Posiva´s contact person of a commission is responsible that these instructions are appended to the purchase order.

The contractor delivering data is responsible for delivering the data at correct time and its compliance with the instructions. The data can be delivered to Posiva, to contact persons or directly to JP-Fintact. The contractor is also responsible that the delivered final version of data is the same as presented in the corresponding report.

In case the contact persons of the commission get draft data, they check the data and send the draft version to JP-Fintact for archiving.

Posiva´s consultant JP-Fintact Oy is responsible for the checking and archiving the data and of appending the data description files to the draft versions of data.

5 ACCEPTED MEDIA

Diskette
- DOS-format
- 3.5" 1.44 Mb (DS, HD)

CD-R disk
- 650 Mb, 74 min

If the amount of data is very high, other media (e.g. tapes or dvd:s) can be used. The exceptions should be agreed with Posiva.

The data should be unzipped. Delivery of the final version of data by email is not allowed. Draft versions can be sent also by email and as zip-files.

6 FORMAT

Windows ANSI.

The files should be text files, with properly separated fields (the separator can be tabulator, comma, semicolon etc.). Image files are accepted, preferable format are gif, jpg or bitmaps. When the data is complex and it is not meaningful to be saved in the formats named before, special arrangements should be made with Posiva. In many cases a Viewer or

Reader program is available and the data can be delivered accompanied with the Viewer or Reader program.

7
ORGANISING DATA AND FILE NAME CONVENTIONS

Draft version of data

When delivering the draft version of data the contractor can send only the data files. It is still urged that the data would be well organized. Data description files are not required. They will be compiled by JP-Fintact Oy.

Final version of data

The data files are organized in folders. Each folder contains files, which are described by the same keywords (see App. 2) in the description file named *kuvaus.txt* (see App. 1). The keywords are used for searching the data from the TUTKA-database.

In the description file *kuvaus.txt*, the contents of the data files should be described and information on the investigation method used should be given. More detailed instructions on filling the fields of the description file are given in App. 2. The application used to archive the data reads the fields from the description file. To ensure the proper operation of the software it is of uttermost importance that each folder contains a file named *kuvaus.txt* and that the first seven lines of the file are the numbered lines shown in Appendix 1. The description file should be a Windows ANSI text file as the data files, if not otherwise agreed.

The accepted keywords that should be used when filling the fields on lines 1-6 are listed in App. 2. The listed keywords should be preferred, but if an appropriate one is not found, for example when new investigation methods are taken into use, the contractor can use a new keyword.

Otherwise the description file can be freely filled. The data should be described in such a detail, that it can be further used even after years. Especially, the following aspects are of importance:
- each field/column of the data file is described
- abbreviations are explained
- units are mentioned
- coordinate system used (i.e. positive direction of each axis)
- borehole length should be measured from ground surface
- explanation how the angles are measured.

Data files can be named freely, but the use of the signs å, ä, ö and spaces is not allowed. Capitals can be used, but the filenames should not be differentiated by use of either small or capital letters (e.g. files named

4 4

POSIVA OY	Asiakirjan nimi	Asiakirjatunnus	Sivu(t)
Tutkimus	**TYÖOHJE**	**TYÖ-O-02/02-REV1**	**4 (5)**

aaaa.txt and AAAA.TXT can not be in the same folder). See Figure 1 for an example of organising data in folders.
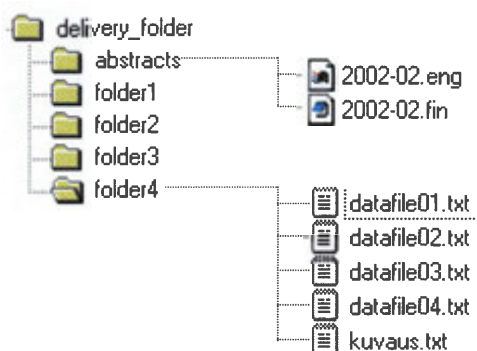
Figure 1. Organizing data in folders.

The diskettes/CD-R discs should be labeled with number and total number of the delivered discs (e.g. 2/5) and the report number, if it is already known, date and contractor.

In addition, the Finnish and English abstracts of the report are to be delivered as text-files (not in for example MSWord format). The abstracts are saved in their own folder with no description file. The files are named in the following way:

Finnish abstract: *number of the report.FIN*
(e.g. 2001-05.FIN, POSIVA-2001-05.FIN)

English abstract: *number of the report.ENG*
(e.g. 2001-05.ENG, POSIVA-2001-05.ENG)

For the reports in the Working Report series, use only the number, for reports in other series use also series marking.

At the beginning of both abstract files, the name of the authors and title of the report are to be mentioned, preferably in the format, which can be used in the reference list, see example below.

In file 2002-41.FIN
Backman, B., Kahelin, H., Paaso, N. & Ahonen, J. 2002. Vesinäytteiden otto ja analysointi Olkiluodon matalista kalliorei'istä (PR ja PP) sekä pohjavesiputkista (PVP) vuonna 2002. Helsinki: Posiva Oy. 51 s. Työraportti 2002-41.

In file 2002-41.ENG
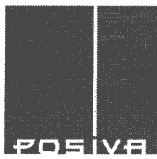
Backman, B., Kahelin, H., Paaso, N. & Ahonen, J. 2002. Groundwater sampling from drilled holes (PR and PP) and groundwater tubes (PVP) at Olkiluoto in 2002 (in Finnish with an English abstract). Helsinki, Finland: Posiva Oy. 51 p. Working report 2002-41.

8
TIME OF DELIVERY

Draft version of data
Data is delivered as soon as it is ready and some preliminary checks are done. Data can be delivered either to the contact persons for checking and after the checks he sends it further to JP-Fintact for archiving in TUTKA or directly to JP-Fintact.

Final version of data
Data is delivered with the original of the working report. Data can be sent to Posiva or directly to JP-Fintact.

9
SPECIAL REQUIREMENTS

If the requirements or practices presented in this guideline cannot as such be followed, procedure MEN-O-30/98 is followed.

APPENDICES

1. Description file *kuvaus.txt*
2. Keywords to be used in the description file of the TUTKA-database
3. Example of the abstract file

DESCRIPTION FILE

1. Investigation site:
2. Borehole/survey line:
3. Discipline:
4. Method:
5. Type of data:
6. Contractor:
7. Contract number:

Investigation method and used equipment:

Measured parameters:

Measurement points/lines and measurement interval (e.g. start depth, end depth, survey line interval etc):

Changes made to original (measurement) data (processing and calibration of data etc.):

Changed files:

Description of the data fields in the files, notation, units and abbreviations used:

File format:

Other information about the measurement, equipment or data:

Report(s) written about the investigation or measurement (authors, name of the report, year of publication):

INSTRUCTIONS FOR FILLING THE KUVAUS.TXT FILE - LIST OF THE KEYWORDS

- No title or empty line is allowed in the beginning of the description file, the first line should contain the first keyword (1. Investigation site)
- The fields 1-6 can contain only one keyword. The accepted values are listed in the following. If none is appropriate, the contractor can use a new one.
- The contract number is written to line 7 (e.g. 7. Contract number 952/01/HH)
- The text after the keywords can be freely formatted.

1. Investigation site:
   Eurajoki Olkiluoto
   Loviisa Hästholmen

2. Borehole/survey line:

Borehole/survey line etc.	Description
EP*	Multilevel piezometers, * is the id of the piezometer e.g. EP10
HSP*	HSP (Horizontal seismic profiling)-survey lines, * is the id of the line e.g. HSP6,
HSP-survey lines	data from several HSP-lines in the same folder
KA*	Wells, * is the id of the well e.g. KA1
KR*	Boreholes, * is the id of the borehole e.g. KR14
Airborne survey area	
Sounding stations (SAMPO)	
GPR-survey lines	
Shallow wells	
ONK-PH*	Pilot hole drilled to ONKALO
ONK-PVA*	
ONK-KR*	
PA*	Shot hole for tube wave measurement, * is the id of the hole e.g. PA3
PP*	Shallow core drilled holes (bedrock), * is the id of the hole e.g. PP10
PR*	Percussion drilled hole, * is the id of the hole e.g. PR1
PVA*	Groundwater monitoring station in VLJ repository, * is the id of the station e.g. PVA3
PVP*	(Perforeated) stand pipe in overburden, * is the id of the pipe e.g. PVP3
S*	Seismic survey line, * is the id of the line e.g. S1
Seismic survey lines	data from several seismic lines in the same folder

TK*	Research trenches, * is the number of the trench e.g. TK1
Investigation site	
Investigation site and environments	
VLJ-KR*	borehole in VLJ-repository, * is the id of the borehole e.g.VLJ-KR1
VLJ-repository	
VLJ-Research tunnel	
YD*	borehole in VLJ-repository area, * is the id of the borehole e.g. YD13

3. Discipline:
   TUTK   General site or coordinate data
   GEOL   Geology
   GEOF   Geophysics
   GEOT   Geotechnical and rock mechanical studies
   GEOH   Hydrogeology
   KEMI   Groundwater chemistry
   YHDI   Combination of the data from the fields mentioned above
   MALL   Modelling

4. Method:
   Acoustic full wave form
   Acoustic P-wave
   Acoustic S-wave
   Acoustic televiewer imaging
   Acoustic tube wave
   Airborne survey
   Amount of flushing water
   AMT
   Apparent porosity in bedrock
   Bail-test
   Bedrock density
   Bedrock density in intact rock
   Bedrock resistivity
   Bedrock resistivity in intact rock
   Borehole radar reflection measurements
   Borehole tomography
   Borehole-TV
   Caliper
   Chemical field measurements during groundwater sampling
   Chemical field measurements during groundwater sampling and laboratory analysis
   Chemical monitoring during groundwater sampling
   Conductivity of flushing water
   Constant head injection test (HTU)
   Coordinates of investigation holes/lines
   Core disking
   Core loss and brokeness
   DC resistivity
   Deviation measurement
   Digitizing
   Dipmeter

Electromagnetic frequency sounding (layer model)
Electromagnetic frequency sounding (salinity)
Electromagnetic frequency sounding (SAMPO)
Elevation
Fall-off test
Flow measurements
Fluid logging, resistivity
Fluid logging, salinity
Fluid logging, temperature
Fluid resistivity
Fluid salinity
Fluid temperature
Fracture frequency, mapping on outcrops
Fracture list
Fracture mapping on outcrops
Gamma-gamma density
Geological mapping
Gravimetric survey
Ground penetrating radar
Grounding resistance
Horizontal seismic profiling
Hydraulic head
Hydraulic head measurement
Hydraulic head, fall-off
Hydraulically conductive fracture zones
Interface between fresh and saline water
Lineament interpretation
Lithology
Magnetic survey
Mechanical strength properties of the rock
Microscopic petrography
Mineral composition
Natural gamma radiation
Neutron-neutron
Oriented core samples
Petrophysical measurements
Poisson's ratio, dynamic
Precipitation
Pressure measuring in flow measurements
Pressure of flushing water
Principal component analysis
Pumping test
Reduced temperature
Reflection seismic survey
Registering drilling parameters (MWD)
Resistivity Wenner
Resistivity, long normal
Resistivity, normal (70 cm)
Resistivity, short normal
Resistivity, Wenner
Rock mass quality (Q-system)
Rock mechanical measurement
Rock stress measurement with hydraulic fracturing
Rock stress measurements

Rock type classification using pattern recognisation (methods)
RQD and fracture frequency
Schistosity
Sea level
Seismic reflectivity coefficient
Seismic refraction survey
Seismic tube wave measurement
Self potential
Slingram
Susceptibility
Tightness test of measurement pipes
Tightness test of packers
Water sample pumping
Water table
Weathering degree
Vertical Radar Profiling
Vertical seismic profiling
Whole rock analysis
VLF, station GQD (19,0 kHz)
VLF, station JXZ (16,4 kHz)
VLF-electromagnetic survey
VLF-R, station GQD (19,0 kHz)
VLF-R, station JXZ (16,4 kHz)
Young's modulus, dynamic

5. Type of data:

MIT	original measurement data
KÄS	processed measurement data (e.g. calibration and corrections done)
TUL	interpreted data
MAL	data resulting from modelling
TEK	text information e.g. descriptive data like lithology
KAR	maps
KUV	image data
MUU	other type of data

6. Contractor:
name of the company/organisation

7. Contract number:

EXAMPLE OF THE ABSTRACT FILE (2001-33.eng)

ABSTRACT

The bedrock model of Olkiluoto site has been updated during spring 2001. The most significant new observations are from the new boreholes KR11 and KR12 and from the extended parts of boreholes KR6 and KR7. In addition, vertical seismic profiling data (VSP) from boreholes KR1 and KR2 and some other older results were revised. As part of the modelling work, shear sections at specific borehole sections are mapped. The bedrock model is done using the ROCK CAD NT geological modelling system.

Main rock types at the Olkiluoto site are migmatic mica gneiss and at the southern parts of the island strongly migmatised veined gneiss. The northern border of veined gneiss has been moved southwards. There are several smaller tonalitic gneiss and tonalite/granodiorite bodies. The extension and form of these units have been revised according to the new observations. At the central part of the site, several distinct units replace the previously large, uniform granite/pegmatite body. There are also narrow, steeply dipping diabase dykes. The extension of dyke northwest of boreholes KR3 and KR5 has been elongated towards northeast. New diabase units have been modelled at the surroundings of borehole KR6.

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Organisaatio	Asiakirjan nimi	Asiakirjatunnus	Sivu(t)
Paikkatutkimukset	TYÖOHJE	TYÖ-O-03/04	1 (24)

Laatija(t)/Pvm	Tarkastaja(t)/Pvm	Hyväksyjä(t)/Pvm
Sanna Riikonen / 13.10.2004	Heikki Hinkkanen, Tarja Nurminen	Juhani Vira

USER MANUAL OF TUTKA DATABASE

1 INTRODUCTION

TUTKA data management system has been used to store the field investigation data collected during the site investigation programme. The data has been systematically gathered since the beginning of the site investigations in 1987 and the first version of the TUTKA-program currently in use was taken in operational use in 1994. The database is a Microsoft Access based meta database containing information on and reference to the actual data, which is stored separately. Also, the abstracts of the Working reports and POSIVA-reports are stored in the database.

The functionality of the TUTKA –program depends on the rights given to the user. This manual describes all the available functions including data archiving and retrieving data from the database as well as installation and user management.

2 SYSTEM AND SOFTWARE REQUIREMENTS

Windows2000 or Windows XP operating system running MSAccess 2000 or MSAcess 2002.

Memory requirements: about 10 Mb hard disk space for the program files and 50 Mb for the database and currently 11.5 Gb for the data folders (including all six investigation sites, Olkiluoto data folders are currently just below 4 Gb).

3 PROGRAM SETUP

TUTKA-system consists of three MSAccess (*.mdb) files;
- the program database *Tutka2000_1.2.mdb*,
- the parameter database *Tutka_Param.mdb* and
- the actual database *TutkaDat.mdb*.

Installation
Copy the files *Tutka2000_1.2.mdb* (the program file, the version number will be changed, when the program is updated), *Tutka_Param.mdb* (the parameter file) and *Tutkadat.mdb* (the database).

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Organisaatio	Asiakirjan nimi	Asiakirjatunnus	Sivu(t)
Paikkatutkimukset	TYÖOHJE	TYÖ-O-03/04	2 (24)

Laatimispvm
Sanna Riikonen   13.10.2004

The data is copied to a subfolder *Data* in the same directory. Also a subfolder called *Toimitus* is created for the data to be delivered. The directory structure is shown below.
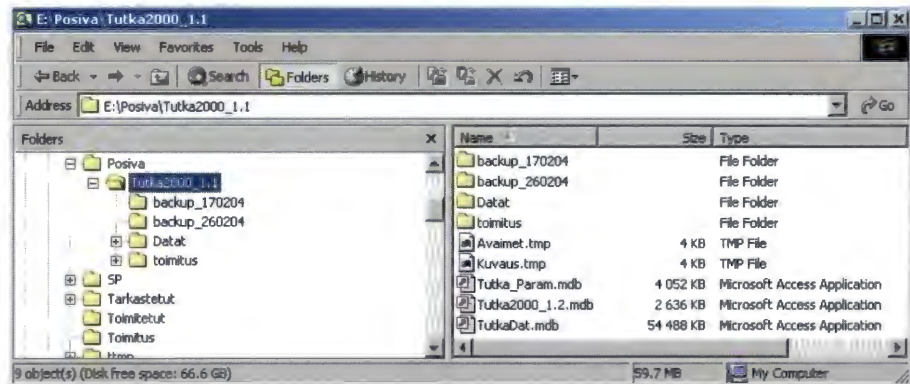
Linking the tables

Open the file *Tutka2000_v1.2.mdb* in MSAccess by simultaneously pressing the Shift button.
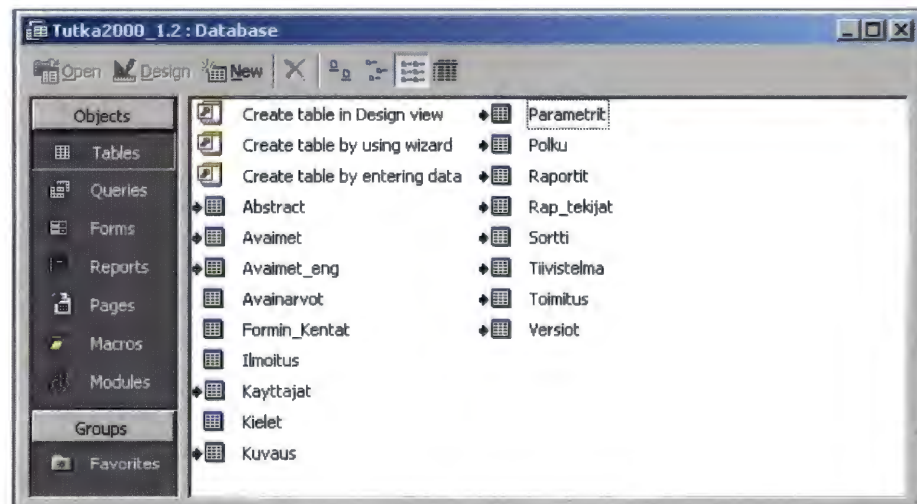
Select *Tables*.

Delete all the tables, which have an arrow before the table name.
Link the new tables from the database file by selecting *File/Get External Data/Link Tables*

Open the databasefile *Tutkadat.mdb*.

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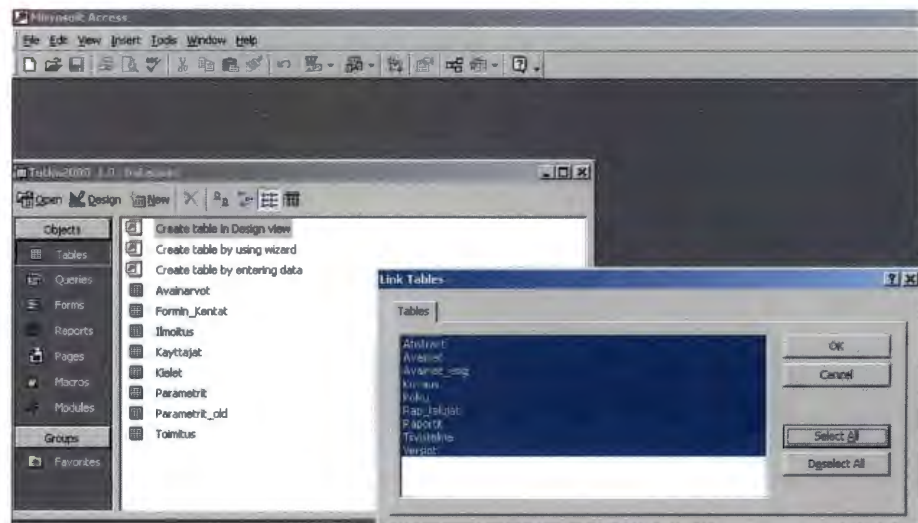
In the *Link Table* –window press Select all –button and then OK – button.
Close Access.

Setting program parameters
Open the file *Tutka2000_v1.2.mdb* in MSAccess by simultaneously pressing the Shift button. The setting can be changed also in the file Tutka_Param.mdb as the Table *Parametrit* is linked.

Activate *Tables/Parametrit*.
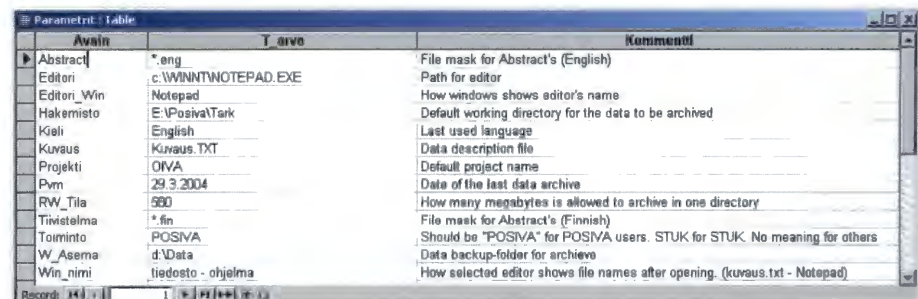
Check and change the parameters if needed:

Hakemisto *	default working directory for the data to be archived.
Editori	program to open the files
Projekti *	default project name
RW_Tila	size of the subfolders in the folder *RW_Asema*, currently set so that a subfolder (data from one site and one project) and the database fit to one CD-disk

Toiminto   set to POSIVA or STUK disables the user identification validation. Other values have no meaning.

W-asema*   Data backup-folder, has the same structure and contents as the Data folder in the TUTKA main directory. For the data protection reasons the two data folders should be on two physically different drives.

The parameters marked with an asterisk, can be changed also from the *Parameters*-menu in the *Check research data* window

Data Folders

The archived data is organised in folders as depicted in the figure below. The maximum size of the subfolders is defined by the parameter *RW_Tila*. The user has to manually add any new site folder, subfolders to the site folders and project folders to the subfolders.
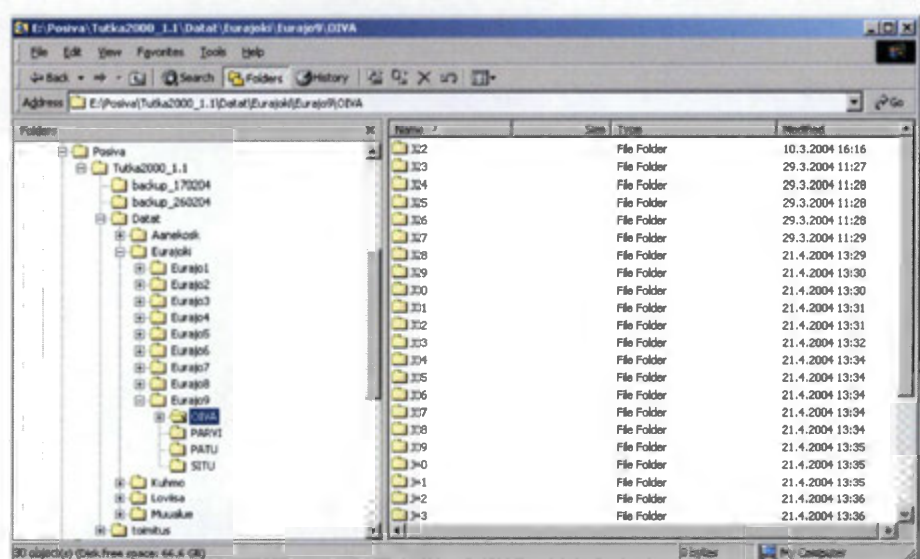
The file *NIMI*, as in the figure below, telling the current data directory, where the data files are to be stored, should be at the uppermost level in the data folder.

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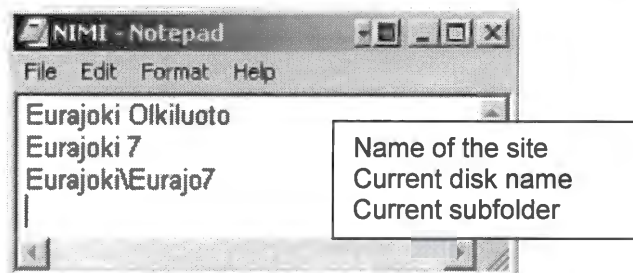
If data from another site or to another (new) subfolder is to be stored, the *NIMI*-file has to be edited accordingly.

Creating a new subfolder
When a subfolder of one site is full, create a new subfolder in the site folder. The name of the folder starts with the name of the site and ends to the order number of the folder e.g. *Eurajo8*.

4   USER MANAGEMENT

All users of TUTKA data archive outside Posiva and STUK need a username and a password. The users can have different types of rights affecting what they can see in the data archive or do with the archive.

For the user management, press the Users-button in the *Menu* window. The button is shown only for users, who have rights for user management.

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The *Users* window opens.
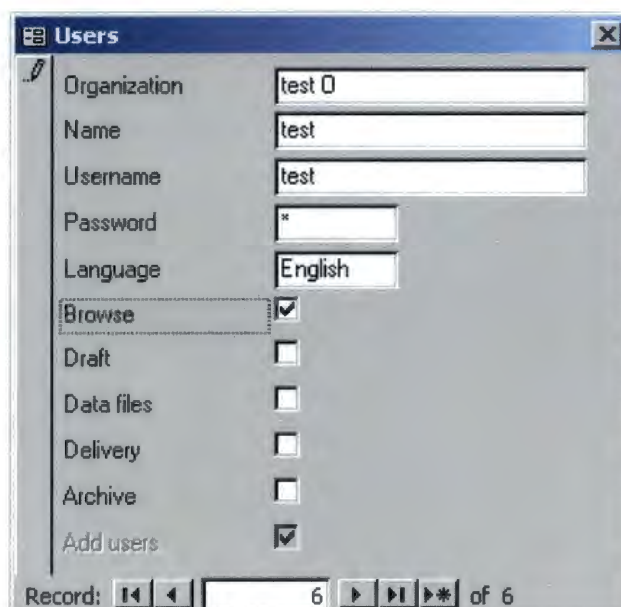
Adding new user

In the *Users*-window password, name and organisation and the preferred language for each user are given and the user rights set. Two

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users cannot have same password. To add a new user press the ⊾∗⌐ button, to clear all fields and fill in the required information.

Remove a user
Select all information by clicking the left side of this window. Then press Delete and answer Yes to confirm deletion.

Setting the user rights
The user rights are set to by adding or removing the tick mark in the check boxes. The options are as follows:

- **Browse** means that the user can only browse the database without seeing the actual data files. Buttons related to data file opening and data delivery are disbled in the *Data archive* window

- **Draft** means that the user can also see the draft versions of data. If this option is not selected, the user can't see the Show drafts option in the *Data Archive* window.

- **Data files** means that the user can also see and open the data files. Then he has also have to have appropriate rights to the data folders.

- **Delivery** means that the user has right to retrieve and deliver data from the database to third parties. The user has also have to have appropriate rights to the data folders.

- **Archive** means that the user has right to archive data in the database. The user has also have to have write permission to the data folders.

- **Add users** means that the user has right to change the user settings. This option cannot be set in this window, changes has to made directly in the database, see below.

Setting the Add users option
Open the file *Tutka_Param.mdb* in MSAccess by simultaneously pressing the Shift button. Alternatively, open MSAccess. From the File Menu select Open and open the file *Tutka_Param.mdb*.

Select *Tables/Kayttajat* and do the necessary changes.

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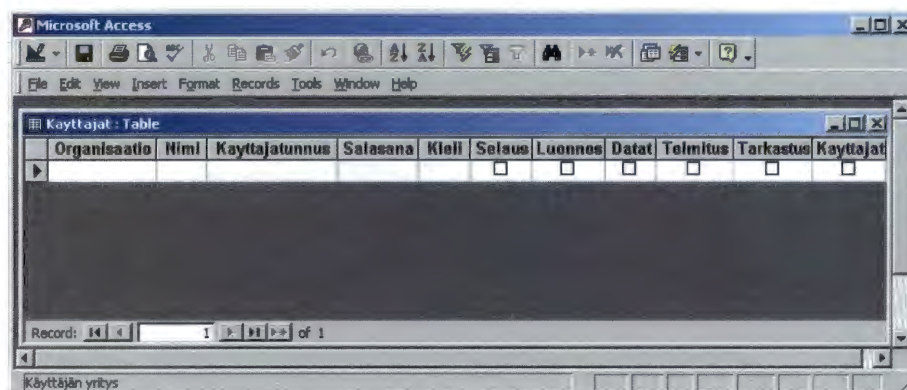
The table containing the user information can also be directly edited.

In addition, the user must have write permissions to all folders used by the TUTKA program (see the parameter list).

5   STARTING THE PROGRAM

Logging in

Open the TUTKA program file *Tutka2000_v1.2.mdb* by double-clicking its name. If the user belongs to an organisation, where the username and password are required, the following window appears:
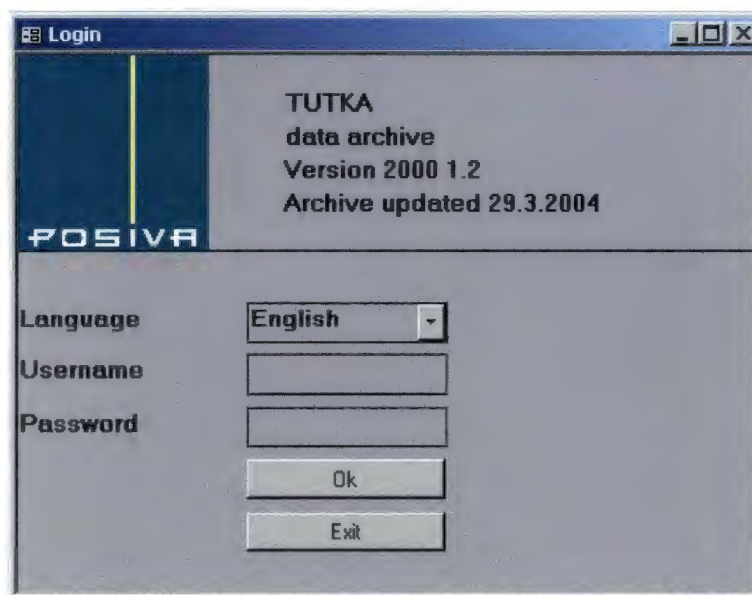
On top of the window the TUTKA-program version is shown together with the date of the latest update of the database.

From the **Language** drop down menu, select the language in which you want to use the program, either *Finnish* or *English*. The texts

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in the windows and in the menus are shown in the selected language. In the database itself only the keywords and the newer abstracts are in both languages. For example, the description files giving additional information about the data are only either in Finnish or in English, mostly in Finnish only.

Pressing OK launches the TUTKA-program providing that the username and password are accepted.

Pressing Exit ends the program.

TUTKA main *Menu*
The functions can be selected from the *Menu* window. If the username and password are not required, the following window opens immediately when opening the program file *Tutka2000_v1.2.mdb*. The buttons appearing in the window depend on the user rights, see section 6 User Management. Here all available buttons are shown and explained.

On top of the window the TUTKA-program version is shown together with the date of the latest update of the database.

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Selecting language

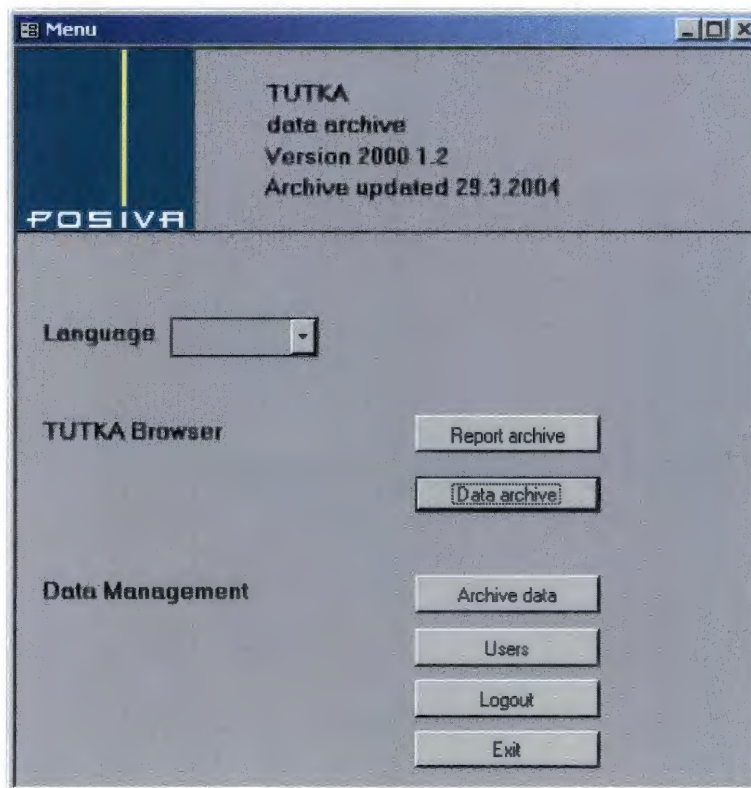From the **Language** drop down menu, select the language in which you want to use the program, either *Finnish* or *English*. The texts in the windows and in the menus are shown in the selected language. In the database itself only the keywords and the newer abstracts are in both languages. For example, the description files giving additional information about the data are only either in Finnish or in English, mostly in Finnish only.

Browsing Reports

The abstract browser is launched by pressing the Report Archive button. The report archive contains the abstracts of the Working reports- and POSIVA-reports series. For details see chapter 11.

Browsing Data

The data archive browser is launched by pressing the Data archive button. The database does not contain the actual data, but it can be viewed and copied depending on the user rights. The database itself contains information about what kind of measurements have been carried out and a short description of the data together with the abstract (both in Finnish and in English, if they exist) of the report. For details see chapter 10.

Archive data

The data archiving functions are launched by pressing the Archive Data button, for the details see section 8 and 9. This button is only shown if the user has the Archive rights

Users

The User management window is launched by pressing the Users button, for details see chapter 6 Users.

Logout

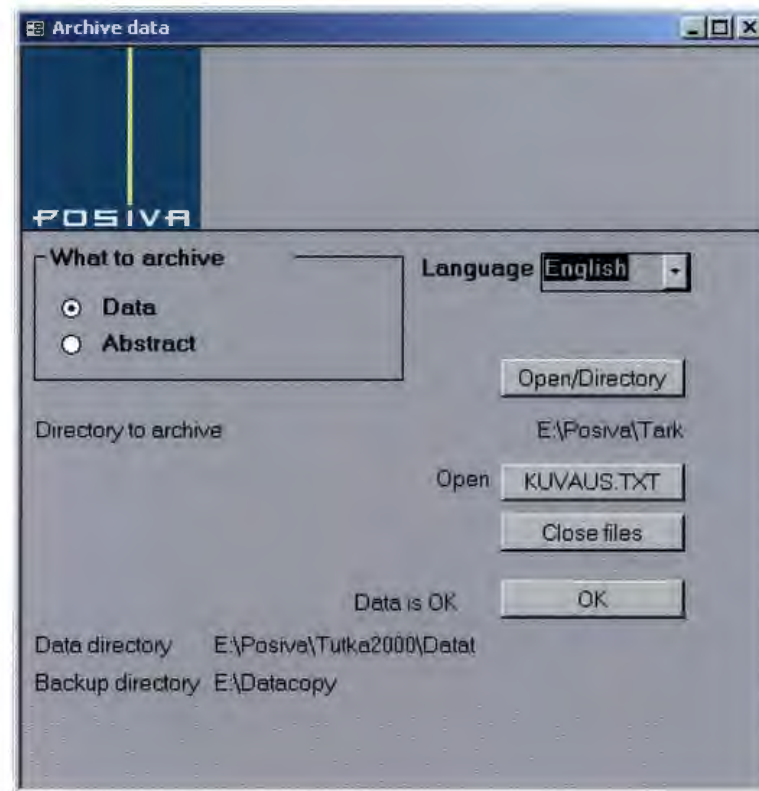By pressing the Logout button user can logout without ending the TUTKA-program.

Exit

Pessing the Exit button ends the TUTKA-program.

6   ARCHIVING DATA

The data files delivered by the contractor are copied to a working directory. The data files should be organized in folders, which contain the description file *kuvaus.txt*, see also TYÖ-O-02/02.

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The *Check research data* window opens after selecting Archive data in the *Menu* window.

From the *Check Research data* window two functions can be selected by clicking the radio buttons on **What to archive** box

- **Data** button is selected when data files are to be archived and archived and
- **Abstract** button is selected when abstracts are to be archived.

The language to be used can be selected from the **Language** drop down list.

The current working directory containing the data or the abstracts to be archived is shown in the field **Directory to archive**. The folders, where the data will be archived are shown on bottom of the window.

To change the current working directory or to open any files in it, press the Open/Directory-button. The following window opens and another folder can be selected.

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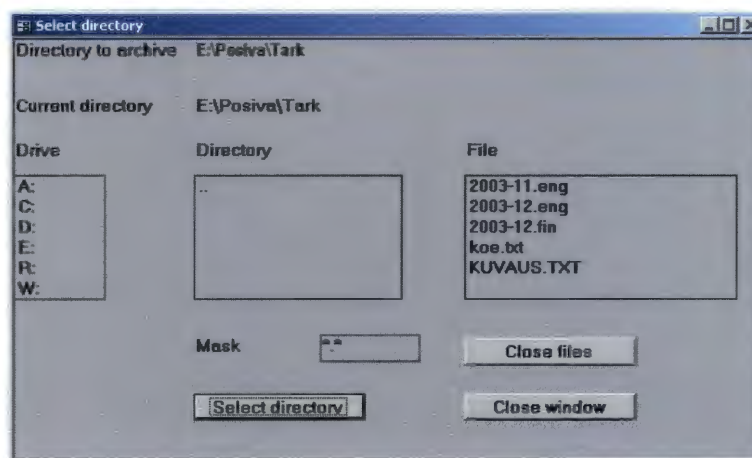
To change the current working folder, press the Select directory -
button. Files can be opened by clicking their names. Pressing Close
files closes all the opened files. To close the *Select directory –*
window, press Close Window –button.

Each of the data folders should contain the data description file *ku-
vaus.txt*, which can be opened by pressing the KUVAUS.TXT-
button in the *Check research data* –window. Any open files can be
closed by pressing the Close files button. The contents and format
of the *kuvaus.txt* file is described in Posiva's working manual
TYÖ-O-02/02.

If the data is correct, it can be archived by pressing the OK-button.

The program automatically checks, that the keywords given in the
description file *kuvaus.txt* match the allowed keywords. If an un-
known keyword is encountered, the *Change description* window
opens.

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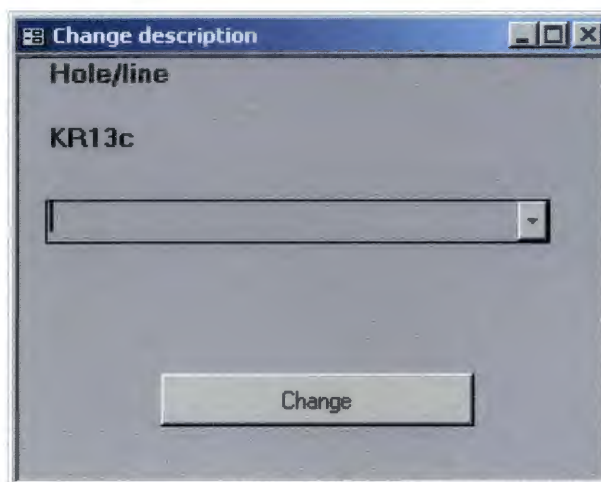
The erroneous keyword is shown and the user can select the correct one from the drop down list. Press Change Button and the program returns to the *Check research data* window. The OK-button has to be pressed once again after any changes in the keywords. Instructions how to add a new keyword are given in section Editing keywords below.

If all the keywords are correct, the *Show keywords* window appears. In this window the keywords given in the description file are shown, together with the automatically added keywords (ref. Number, checked by, date and project).

The user can edit **Report** and **Project** fields, other changes has to be made directly to the file *kuvaus.txt*. A rremark can be added here also.

- **Working report number**
the field is empty for the first data set of the session, otherwise the default is the report number of the last saved data set.

For the Working report series only the report number without the series name is given (e.g. for the Working report 2003-01, the report number is 2003-01) for the other report series also the series

name is given (e.g. POSIVA-2003-01 is given as POSIVA-2003-01).

- **Project**
If the data belongs to another project than the default (currently *OIVA*), the right project can be selected from the drop down list. To add a new project, see section Editing keywords and for changing the default project, see section Setting program parameters.

- **Remarks**
This field can be left empty, but can be used to add useful short notes about the data – the contents of the field are shown in the browser. The remarks field can be edited also in the browser window.

- **Draft**
If the data to be archived is not yet reported, check the **Draft** box. The report number for the draft data is DRAFT-YYYY-MM, where YYYY is the year and MM is the month (e.g. DRAFT-2003-01).

- New version
If the data is an updated version of an existing data set, a new version of the data has to be done, for instructions see section Data version management.

- Copy files
If the data is in order and the possible linking to a previous version is done, press Copy files –button. The key information is copied to the database and the data itself to the data folder. The needed size is shown at the bottom of the window. If the data is successfully archived, a message is shown. If there is not enough space in the data folder to store the data, an error message is shown. A new subfolder has to be created, for the instructions, see section Creating a new subfolder.

Close –button closes the window without archiving the data.

Editing keywords
In the *Check Research data* window, select the desired key value from the *Key values* –menu. The *Key values* -window opens.
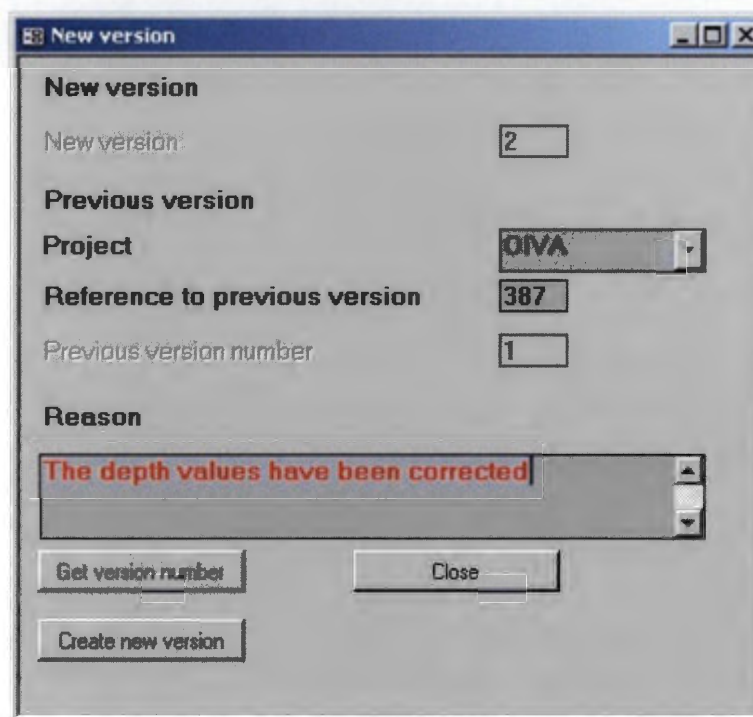
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Select the keyvalue to be changed or deleted form the drop down list. The value of the key word in the other language is shown automatically. Modify the key word and press Change –Button to apply the changes or press Delete –Button to delete the keyword from the keyword-list. These changes do not affect the datatables containing the stored data, only the list of allowable keywords used in the data inspection.

To add a new key value write the value both in English and in Finnish in the appropriate fields and press Insert – button. If the field for the second language is left empty, the same value is used for both languages.

Data version management
There is a possibility to save different versions of the same data, like draft and final version, or a new version of the data, if any corrections are made. The different versions are linked with each other. The linking is done by pressing the New version -button in the *Show keywords* -window. The reference to the previous version has to be searched in the *Data archive* window in advance. The *New Version* window opens.

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Give the **Project** (of the previous data set) and **Reference to the previous version** and a short description, why the new version is made. Press Get version Number – button and then Create new version –button. The window can be closed by clicking the Close – button. The user returns to the *Show keywords* -window.

7   ARCHIVING ABSTRACTS

To archive abstracts press Archive data –button on the *Menu* window, this button is shown only if the user has the archive rights. In the *Check research data* -window select **Abstracts** from the **What to archive** –box. Change the working directory to the one containing the abstracts. This is done similarly as described in section 8 for the data.

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Each abstract is saved in a text file, which is named according to the report number and the file extension is either .fin for the abstract in Finnish or .eng for the abstract in English (see TYÖ-O-02/02). After selecting the folder, the *Archive abstracts* window opens.

The abstracts can be viewed by pressing the Open abstract (fin) – or Open abstract -buttons. Fill the key information about the report:

- **Working report number**
The report number is by default the first report in the selected folder. The name for Working reports is just the number of the report, for the other reports, the series name is included.

- **Project**
Change the project if the default value is not correct, the default project is determined in the program parameters.

- **Title in Finnish**
Give the title of the report in Finnish.

- **Title in English**
Give the title of the report in English.

- **Publisher**
By default Posiva Oy, but can be changed if necessary.

- **Report type**
Name of the report series, by default *Työraportti* (Working report series).

- **Language**
The language the report is written in.

- **Year**
Year of publication of the report.

- **Organisation**
This is an auxiliary field, used only to search for and copy the organisations from the keyword list to the **Authors** field. The contents of this field are not stored in the database.

- **Authors**
Authors of the report and their organisations. The name of each author (in the form surname, I. I is the initial of the first name of the author) is written in a separate line, followed by the name of the organisation in the next line (see the image of the window for an example).

- **ISBN number**
If the report has an ISBN number, it is given here, otherwise the field is left open.

- **Pages**
Number of pages in the report.

- **Appendices**
Number of appendices in the report, if they are not included in the number of pages already.

To store the abstracts in the database press the buttons Abstract (fin) OK and Abstract (eng) OK.

The window automatically closes, when both abstracts are archived. If the abstract of the same report is stored for a second time, the program asks if the user wants to overwrite the existing abstract in the database. Only one version of the abstract can be archived.

8   BROWSING DATA

The database contains a description of and a reference to the field measurement data and its interpretations gathered during the site
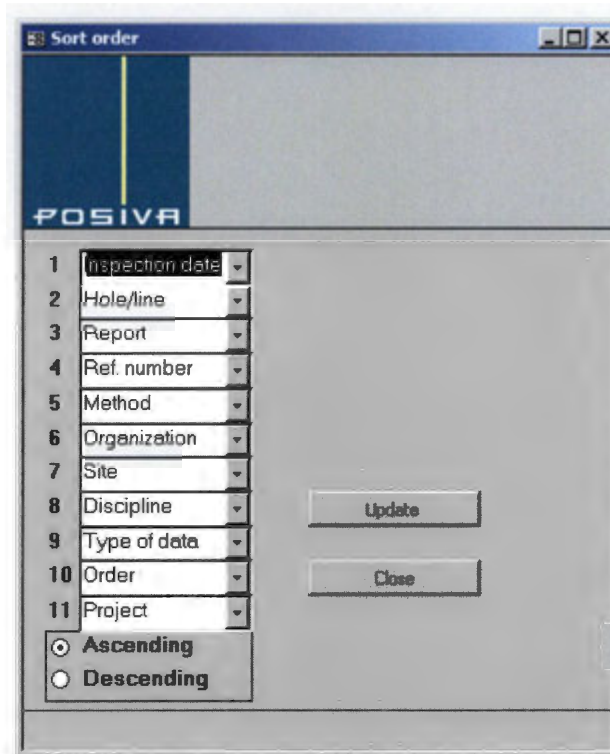
characterisation program. Due to the amount of data and the diversity of the data formats, the data itself is stored on separate files. The data browser is launched by pressing the Data Archive – Button in the *Menu* -window. The *Data archive* window opens, the buttons shown in the window depend on the user rights. Below all available buttons are shown and their functions explained.

The data can be searched by selecting the keywords or any combination of them from the drop down lists on the left hand side of the window (**Search for** column).

To start a new search, the fields can be cleared by pressing the Clear fields button.

Setting the Sort order
The user can define the order in which the search results are sorted by pressing the Sort order button. The following window opens.

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To show all versions of the data, select the **Show all versions** checkbox. Otherwise only the most recent version is shown. There can be several versions of the same data, if some errors have been found in the data and corrected or the data has been reprocessed or reformatted.

To show also the draft versions of the data, select the **Show drafts** checkbox. This option is available only if the user has the rights to see the draft data. Otherwise only the final, published version of data is shown. If the draft versions of already published data are to be browsed, also the **Show all versions** checkbox has to be selected. Draft versions of the most widely used data like drilling and core mapping and hydraulic conductivity measurements are archived as they are often needed for the further use long before it is reported. The database makes it possible to keep track of the use of the data. The feature of archiving also the draft versions was taken in use 1.1.2003.

The search results are shown on the right hand side of the window (Results column). On the top right corner the total number of the database entries matching the search criteria is shown. The user can browse through the search results using the First, Next, Previous and Last buttons. The results are sorted according to Sort order options. If the **Show all versions** checkbox is selected, the different versions of the same data can be browsed by pressing the array

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buttons on the version row. Browsing through different versions of data does not affect the search keywords or the sort order of the results.

The data description file giving more detailed information about the measurement and the data contents can be viewed by pressing the Description button. The abstract of the active report can be viewed by pressing the Abstract (fin) or Abstract button.
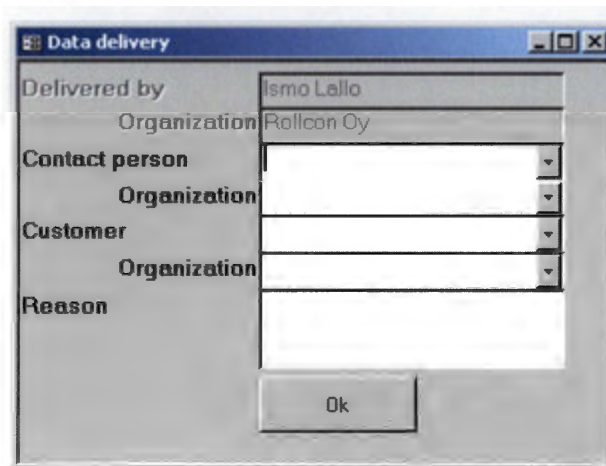
To view the actual data, press the Open button and select the file to be viewed from the *Select directory* window. This button is available only if the user has the *Data files* option set.
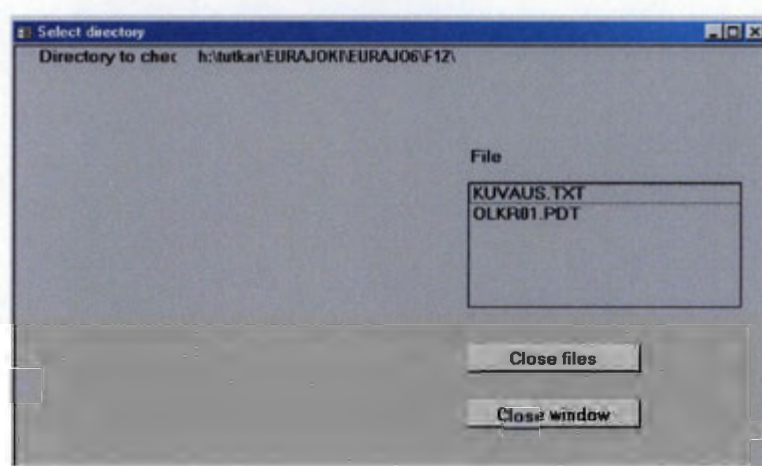
Retrieving data for delivery

The required buttons are only visible if the user has the Data delivery rights set. Empty the delivery folder *Toimitus*.

Press ▮▮▮▮▮-button. Window *Data delivery* opens.

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Give the required information about to whom the data is to be sent and who authoritised the data delivery and the reason for data delivery, see also TYÖ-O-29/98. This information together with the keywords of the sent data is saved to the databse Tutka_Param.mdb. After pressing the OK button, the program returns to the *Data Archive* window.

To copy only the active data set to the delivery folder press Copy and to copy all the data sets resulting from the search, press Copy All-button.

To add new data to the delivery folder, make a new search. After all the asked data sets are gathered to the delivery folder, copy the contents to a CD for delivery or send the data by email. Empty the delivery folder before searching the data for next delivery.

Remarks
It is possible to add short comments about the data set, like more detailed information about the investigation method or corrections made. To make a remark, write the note to the **Remark** field and press the Remark button to save the note to the database. Remarks can be made only by users having the Archive rights.

Remarks can be done also when archiving the data in the *Show keywords* window, see chapter 8.

9 BROWSING REPORTS

The report archive contains the abstracts of the Working reports and POSIVA-reports and YJT-report series. In addition, abstracts of some other reports are included, if the reports contain field measurement data.

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The reports can be searched by selecting the keywords or any combination of them from the drop down lists on the left hand side of the window (**Search for** –column). In the text boxes for the title either in Finnish or in English and for the author any text can be written (for example the borehole id) and the given text is searched within the text in the corresponding field of the database.

To start a new search, the fields can be cleared by pressing the Clear fields button.

The Search results are shown on the right hand side of the window (**Results** column). On the top right corner the total number of entries matching the search criteria is shown. The user can browse through the search results using the First, Next, Previous and Last buttons. The abstract of the active report can be viewed by pressing the Abstract (fin) or Abstract button.