1. BASIC INFORMATION

1.1. CRIS Number 2004/016-689.01.03

1.2. Title Upgrading the Information System of Variety Testing and Seed Certification in Hungary

1.3. Sector Agriculture

1.4. Location Hungary

2. OBJECTIVES

2.1. Overall objectives

Transition Facility Program will improve the efficiency of public administration work at the National Institute for Agricultural Quality Control (NIAQC) contributing to the establishment of a high level hardware, software and database infrastructure.

2.2. Project purpose

Establishment of an up-to-date IT infrastructure for variety testing, developing and installing new software on increased hardware capacity.
Finalization of the software development scheme for seed certification in order to achieve a harmonized, comprehensive database and online link system, to all corresponding national and international authorities.

2.3. Justification

In the Comprehensive Monitoring Report on Hungary’s preparation of membership (5 November 2003) the following insufficiencies were stated:
“In the field of phytosanitary legislation, the new Act No. 2003 LII. on the ‘Official acceptance of plant varieties as well as production and marketing of reproductive material’ was adopted in June 2003 to ensure transposition in the seed quality sector. Some implementing legislation remains to be adopted, in particular concerning maximum residue levels for pesticides. The administrative capacity (including laboratories) needs to be strengthened to ensure proper implementation.”
3. DESCRIPTION

3.1. Background and general justification

Legal harmonization is expected to be accomplished by the accession as the LII/2003 Act on „State registration of plant varieties, production and marketing of seeds and propagating materials” enters into force and all implementation MARD Decrees will have been signed. National legislation provides comprehensive legal background for the mandatory activities of NIAQC. Hungary will have a monitoring and reporting obligation to several national institutions and to the European Commission (ie. DG SANCO and DG AGRI). Data banks with easy querying functions and a reliable networking infrastructure are essential to carry out effective daily data transfer and on line tracking.

NIAQC as designated authority for seed certification works in close cooperation with other governmental authorities like the Hungarian Customs Authority, National Phytosanitary Service, Agricultural and Rural Development Agency (ie. border inspection of seed lots, direct payments) by a direct network. Fund of Transition Facility Program will contribute to the upgrading of the IT infrastructure in seed certification.

In case IT development would be realised using only NIAQC’s own resources, accomplishment is expected to be finished significantly later and some obstacles may hinder smooth administration work after accession. NIAQC officials will face longer administration time including relative high level of manual work to comply with EU legislation. A high capacity IT system shall increase the competitiveness of the Institute, and result efficient administration with several online links in a longer term.

3.2. Variety testing

Institution building and technical development was focusing on improving the conditions of field trials. This aim has been reflected in the supply tender of the ongoing PHARE project (2002/000-180-01-04-01). IT development was targeting rather the acquisition of personal computers so far. They have to be connected to the central server procured in the framework of the TFP and hosting the databank and other software applications.

Recently, only some DOS based program serve the administration of variety admission to the National List of plant varieties. For networking only public Internet is used. Running programs have to be upgraded and several new modules need to be elaborated and introduced, namely the assessment of field trials, reference collection management and applications. New database has to be introduced for supplying information to the different modules. The database shall be filled up by data conversion and also manual typing.

Fund of the TFP will contribute to the establishment of a complete local network for the Division of Variety Testing, where NIAQC experts as well as their partners will have access through their PC to a high capacity server and data base thus, they will be able to carry out all aspects of variety testing from registration to the granting in a more professional way after the accession by the implementation of the project.
3.3. Seed certification

Software development started four years ago, and first modules are in operation now. The structure of modules in 2002 is introduced in annex 6. New forms, labels and other documents will be introduced after the accession. In order to have a harmonized national -and also international- system, seed certification modules should be modernized to meet the changed conditions of accession. The software development expected to be financed in the framework of TFP means the rewriting of the programs in two modules and their adaptation to the new conditions. The harmonized IT network will be in line with new requirements and modules of the system will be able to communicate inside and outside the country. The modules are independent units but have connection with several links.

3.4. Linked activities

HU2002/000-180-01-04 Improvement of qualification and certification of seeds, propagating material and feeds”

The project includes the HU02/IB/AG04 twinning (with Germany and the Netherlands) and a supply component for the purchase of IT and laboratory equipment and machinery. The 12-month twinning is ongoing, implementation started at the end April 2003.

The twinning program targeted among others the revision of the IT system for variety testing and seed certification. EU experts revealed possible fields of IT improvement for variety testing. The conclusion and a step-by-step approach of the IT expert is introduced in annex 7. The basic concept for upgrading the information system is being elaborated in the framework of the twinning project. The supply component of the project is just before commencement.

3.5. Results

Variety testing:

- High capacity database server and the new software serve appropriate data access and exchange
- Computer aided field trial layout planning and variety matching realized
- Field trial assessment is centralized and carried out on international recommendations
- Local network is established and data transfer to internal and external partners realized

Seed certification:

- Two upgraded software modules will improve the administration of seed lots in certification procedure
- Harmonized national networking system enables NIAQC to communicate with internal and external partners
- On-line follow-up of seed lots in the procedure of seed certification and trade is realized.
- Uniform modular system enables the system to carry out queries and data service (for notification) by different pre-set criteria
3.6. Activities

3.6.1. Service contract

Two service contracts for the software development (for the Division of Variety Testing and Division of Seed Certification) are planned. Brief description of the modules are in the following tables:

### SEED CERTIFICATION

<table>
<thead>
<tr>
<th>Terms</th>
<th>Software module</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Financial module</td>
<td>Generating essential data from other modules for invoicing (for labels, field inspection, seed testing, administration.). Feed back option for non-payment events.</td>
</tr>
<tr>
<td>2.</td>
<td>Official trade control and market tracking</td>
<td>Generating schemes and schedules for official trade control. Registry of official control reports. Producing necessary statistical queries on the whole process of the seed certification for EU and national notification.</td>
</tr>
</tbody>
</table>

### VARIETY TESTING

<table>
<thead>
<tr>
<th>Terms</th>
<th>Software module</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Registration module</td>
<td>Comprehensive administration of variety registration procedure from application to granting.</td>
</tr>
<tr>
<td>3.</td>
<td>Reference collection management module</td>
<td>Reference variety management, selection of similar varieties, test layout management. Registry of seeds in short and long term storage.</td>
</tr>
</tbody>
</table>

Before actual program writing in both cases a detailed system implementation plan- included in the budget - is elaborated on the basis of the needs of the beneficiary. Specific system implementation plan, based on the specification of needs by the beneficiary, and serving as guidance for contractor. The plan harmonizes databases, defines external and internal connections and data handling. Training of the Hungarian experts and maintenance of the system after delivery are included in the budget.

3.6.2. Supply

IT equipment supply is allocated to the Division of Variety Testing. Preliminary list of hardware items is annexed to this Project Fiche (Annex 8).
3.7. Lessons learned

Hungarian experts of IT system design evaluated the recent information system of NIAQC. The twinning part of the running PHARE project resulted in a close cooperation between the German and Dutch IT experts and NIAQC in the form of elaboration of the concept for upgrading the whole IT system.

4. INSTITUTIONAL FRAMEWORK

All technical and administrative aspects of the project shall be the responsibility of the National Institute for Agricultural Quality Control (NIAQC, H-1024. Budapest Keleti K. u. 24.). The Institute is considered as Beneficiary of the project in all related documents. The Central Finance and Contracts Unit (CFCU) will take the responsibility for contracting and payment.

5. DETAILED BUDGET

<table>
<thead>
<tr>
<th>Component</th>
<th>TFP Support</th>
<th>Investment Support</th>
<th>Institution Building</th>
<th>Total ( = I+IB )</th>
<th>National Co-financing</th>
<th>IFI</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment supply</td>
<td>0.082</td>
<td></td>
<td>0.082</td>
<td>0.027</td>
<td>-</td>
<td></td>
<td>0.109</td>
</tr>
<tr>
<td>Technical assistance</td>
<td>0.160</td>
<td>0.160</td>
<td>0.160</td>
<td>0.053</td>
<td>0.213</td>
<td></td>
<td>0.322</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>0.082</strong></td>
<td><strong>0.160</strong></td>
<td><strong>0.242</strong></td>
<td><strong>0.080</strong></td>
<td>-</td>
<td></td>
<td><strong>0.322</strong></td>
</tr>
</tbody>
</table>

According to Phare-funded Institution Building projects, national co-financing is considered to be provided by the MARD who covers certain infrastructure and operational implementation costs, as well as financing the human and other resources, required for effective and efficient absorption of Transition Facility assistance. The costs detailed in the project fiche thus constitute a full grant.

Funding from the Transition Facility for projects concerning small equipment necessary for the implementation of the Acquis must receive co-financing from national public funds. National co-financing is net of VAT.

6. IMPLEMENTATION ARRANGEMENT

6.1. Implementing agency

The Implementing Agency of the project is the Central Finance and Contracting Unit (CFCU). The CFCU will be the Contracting Authority and in that role it will publish tenders, conclude contracts and authorise the Treasury to make contract related payments. The Director of the CFCU will act as Programme Authorising Officer (PAO).
PAO: Mr. Gábor Rónaszéki, Director of CFCU, Hungarian State Treasury
Address: Deák Ferenc u. 5. Telephone: (+361) 327-3652
H-1052 Budapest Fax: (+361) 327-3572
e-mail: gabor.ronaszeki@ahh.gov.hu

The MARD will be responsible for the coordination and supervision of the project. The Head of Department of Member State Affairs (MARD) will act as Senior Programme Officer (SPO). His contacts are:

SPO: Mr. László Vajda, Head of Department
Ministry of Agriculture and Regional Development
Address: Kossuth tér 9-11. Telephone: (+361) 331-3578
H-1055 Budapest Fax: (+361) 301-4663
e-mail: laszlo.vajda@fvm.hu

6.2 Non-standard aspects

During the implementation of the project the National Procurement Rules will be strictly followed.

6.3 Contracts

The project shall be implemented through one equipment supply contract (0,109 MEURO) and one technical assistance contract (0,213 MEURO).

7. IMPLEMENTATION SCHEDULE

<table>
<thead>
<tr>
<th>Contract</th>
<th>Start of tendering</th>
<th>Start of implementation</th>
<th>Completion</th>
</tr>
</thead>
</table>

8. SUSTAINABILITY

All supported investment actions (including supply) are sustainable in the long term beyond the date of accession. They will comply with the EU norm and standards (accredited), and will be coherent with the sector policies of the EU. Future maintenance, IT developing and operation costs will be covered by the Hungarian national budget. All investments will respect the state aid provisions of the European Agreement.
9. CONDITIONALITY AND SEQUENCING

ToR and Technical Specification of the hardware supply tender and Service Contract will be compiled by the accession date. Tendering period expected to end in November 2004, implementation with the reimbursement procedures may be foreseen to end in 2005.
ANNEXES TO PROJECT FICHE

1. LogFrame Planning Matrix  
2. Detailed implementation chart 
3. Contracting and disbursement schedule 
4. List of relevant Laws and Regulations 
5. Indicative allocation table 
6. Scheme of seed certification in Hungary 
7. Extract from the Mission Report of Dr. Uwe Meyer (STE, HU02/IB/AG04 twinning) 
8. Indicative List of Requested Hardware Elements
**ANNEX 1**

**LOGFRAME PLANNING MATRIX FOR**

**Project number:**
2004/016-689.01.03

**Upgrading the Information System of Variety Testing and Seed Certification in Hungary**

**Contracting period expires:**
November 2006.

**Disbursement period expires**
November 2007.

**Total budget:** 0.322 million EUR
**TFP budget:** 0.242 million EUR

<table>
<thead>
<tr>
<th>Overall objectives</th>
<th>Objectively verifiable indicators</th>
<th>Sources of verification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transition Facility Program will improve the efficiency of public administration work at the National Institute for Agricultural Quality Control (NIAQC) contributing to the establishment of a high level hardware, software and database infrastructure.</td>
<td>On line connection to internal and external partners is established and transfer of data realized by the end of project implementation.</td>
<td>Final report of the project Monitoring report of ARDA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Project purpose</th>
<th>Objectively verifiable indicators</th>
<th>Sources of verification</th>
<th>Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establishment of an up-to-date IT infrastructure for variety testing by writing and installing new software on increased hardware capacity.</td>
<td>System plans are ready before 2005. Software written and installed before August 2005 Networking established after software installation.</td>
<td>NIAQC annual report TFP Progress report</td>
<td>Hardware in operation before software installation NIAQC staff is trained for the application of data management in time of installation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Results</th>
<th>Objectively verifiable indicators</th>
<th>Sources of verification</th>
<th>Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variety testing:</td>
<td>Data bases are linked and accessible for querying Direct IT links are established.</td>
<td>Annual report of NIAQC Reports of MARD on progress</td>
<td>Funds for operation and maintenance available when required</td>
</tr>
</tbody>
</table>

- High capacity database server and the new software serve appropriate data access and exchange
- Computer aided field trial layout
planning and variety matching realized
- Field trial assessment is centralized and carried out on international recommendations
- Local network is established and data transfer to internal and external partners realized

**Seed certification:**
- Upgraded software modules will improve the administration of seed lots in certification procedure
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- Uniform modular system enables the system to carry out queries and data service (for notification) by different pre-set criteria.

<table>
<thead>
<tr>
<th>Activities</th>
<th>Means</th>
<th>Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply of hardware</td>
<td>1 supply tender</td>
<td>Minimum 3 acceptable bids High quality project management is provided by NIAQC and EU experts are available for further cooperation. National co-financing available</td>
</tr>
<tr>
<td>Service contract for software development</td>
<td>2 Service contracts</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Preconditions:</strong> ToR and Technical Specification of the hardware supply tender and Service Contract will be compiled by the accession date. Tendering period expected to end in</td>
</tr>
</tbody>
</table>
November 2004, implementation with the reimbursement procedures may be foreseen to end in 2005.
## ANNEX 2

**Detailed Implementation Chart**

<table>
<thead>
<tr>
<th>Year</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Month</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Supply</td>
<td>![Month 1-12](chart supply 2004-2005.png)</td>
<td>![Month 1-12](chart supply 2004-2005.png)</td>
</tr>
<tr>
<td>Service contract</td>
<td>![Month 1-12](chart service contract 2004-2005.png)</td>
<td>![Month 1-12](chart service contract 2004-2005.png)</td>
</tr>
</tbody>
</table>

*Legend:*
- **Light Gray** - Tendering and contracting
- **Dark Gray** - Implementation
ANNEX 3

CUMULATIVE CONTRACTING AND DISBURSEMENT SCHEDULE FOR TFP FUNDS (MEUR)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Contracting</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply</td>
<td>0.082</td>
<td>0.082</td>
<td>0.082</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service contract</td>
<td>0.160</td>
<td>0.160</td>
<td>0.160</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Total (cumulative)</strong></td>
<td>0.242</td>
<td>0.242</td>
<td>0.242</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Disbursement</strong></td>
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<tr>
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<td>0.160</td>
<td></td>
</tr>
<tr>
<td><strong>Total (cumulative)</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>0.242</td>
<td></td>
</tr>
</tbody>
</table>
ANNEX 4

List of relevant Laws and Regulations

EU legislation

2002/53/EC (Common catalogue of varieties of agricultural plant species)
2002/55/EC (Marketing of vegetable seed)
2002/54/EC (Marketing of beet seed),
66/401/EEC (Marketing of fodder plant seed),
66/402/EEC (Marketing of cereal seed);
2002/56/EC (Marketing of seed potato);
2002/57/EC (Marketing of seed of oil and fibre plants);
80/755/EEC (Packaging of cereal seed);
87/309/EEC (Indelible printing of information on packages of seed of certain fodder plant species);
93/62/EEC (Setting out the implementing measures concerning the supervision and monitoring of suppliers and establishments pursuant to Council Directive 92/33/EEC on the marketing of vegetable propagating and planting material, other than seed);
98/320/EC (Organisation of a temporary experiment on seed sampling and seed testing);
99/66/EC (Setting out requirements as to the label or other document made out by the supplier pursuant to Council Directive 98/56/EC)


Regulation (EEC) No 2358/71 of the Council of 26 October 1971 on the common organisation of the market in seeds

Regulation (EEC) No 1686/72 of the Commission of 2 August 1972 on certain detailed rules for aid for seed

National Legislation (entering into force on accession)

2003 LII Act on ‘State registration of plant varieties, production and marketing of seeds and propagating materials
Implementing rules – Ministry of Agriculture Decrees (in draft version yet)
ANNEX 5

Indicative allocation table

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TF</td>
<td>National</td>
<td>TF</td>
</tr>
<tr>
<td><strong>Hardware supply</strong></td>
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<tr>
<td>tender</td>
<td>0.082</td>
<td>0.027</td>
<td>0</td>
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<tr>
<td><strong>Service contract</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>tender</td>
<td>0.160</td>
<td>0.053</td>
<td>0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>0.242</td>
<td>0.080</td>
<td>0</td>
</tr>
</tbody>
</table>
ANNEX 6

Recent structure of seed certification programmes

Field inspection, Seed testing and OECD seed certification modules will provide data to the upgraded Invoicing module and Trade control/ market-tracking module.
Identification

The reason of the visit was Consultation with NIAQC experts on the current IT system registers, NIAQC database, int. Networks, web etc. This activity is related to Variety Testing. The task for the visit was to give support how to set up the IT system for networking, DUS and VCU data processing. In a first step the current IT system was described. Therefore the existing hard- and software is to identify.

Activities during the visit in chronological order

The visit started with a meeting with NIAQC experts to define the tasks and to give a short introduction into the structure of NIAQC. In the meeting testing procedures for DUS and VCU were described by NIAQC experts and they gave some information about the trial designs, data transfer between testing stations and the headquarters of NIAQC and about the activities to use handheld computer (data logger) to avoid the paper form.

After the introduction NIAQC experts gave an insight into the practical work on the current VCU-software system named ‘BORISKA’. The background of the DUS-software was described by outputs in paper form. A demonstration of special software for variety registration named ‘NORA’ followed to continue the meeting.

The testing station in Tordas was visited. NIAQC experts gave a review of all tasks of the testing station. In the seed storage was introduced and it was informed about the plans to install new hardware and network systems.

Additionally NIAQC experts demonstrated self-written software for DUS testing of vegetables and for producing of variety descriptions (VCU like).

NIAQC experts completed information about their current network in Budapest and at testing stations. Data transfer rates of local area network and for internet access were discussed. A short description of IT-structure of the Bundessortenamt in Hannover was explained and a demonstration of handheld data logger and corresponding software was introduced.

Results

NIAQC has 11 testing stations. DUS trials can be conduct on one or two testing stations. The 11 testing stations are not connected by server systems.

The VCU-software ‘BORISKA’ was written 15 years ago in ‘Clipper’ by using ‘Dbase’-files. The software isn’t compatible to new and very fast personal computer and has to be adapted...
in each case of changing of hardware. The reason is the architecture of the underlying programming language ‘Clipper’. Data stored in Dbase-files. It is possible to import such files into future databases. A standardisation of keys has then to be taken into consideration.

The following parts of VCU procedure were discussed and the appropriate parts of the software were presented:

- input of the data, data structure, data flow and controlling of the software by choosing the species, the year and the trial number
- keys for species, for varieties and other
- connection between this program and the application registration program (NORA)
- producing of a list of cultivation for all varieties with information about the status of each variety (standard variety, variety in the first year and so on), information about the origin (country) of the variety, number and names of the locations of the trial series
- producing of lists of data for all varieties over all testing stations with a mean for each variety over the testing stations and a mean, a standard deviation, a coefficient of variation, a plot size and some dates for each testing station
- Microsoft products (Word and Excel) are used to produce reports and descriptive lists
- The DUS-software was written in 1996/1997 in Visual Basic of Applications (VBA) – a product of Microsoft. From 1997 to 2000 there were some updates but not later. NIAQC experts stated that the software isn’t user friendly enough to give it to crop experts, who are not familiar with the software.
- The variety registration software ‘NORA’ was written 15 years ago in ‘Clipper’ by using ‘Dbase’-files. The software is from the same type as the VCU-software ‘BORISKA’.

Conclusions

- Half of the PCs are up to date and connected by a local area network
- Some software applications are Windows based, other software applications are DOS based and have to be rewritten in a Windows or Browser based programming language (Variety registration, DUS and VCU assessment for Field crops). DOS based applications are not ready to use in the nearer future
- It is very urgent to rearrange the storage of files from clients hard discs to file server based system
- A backup and recovery system for all server is necessary
- The keys for species, varieties, locations and other are to be standardized before the start of rewriting of DOS programs
- A central database is necessary to import and to connect all information storing now in dbase files and other structures. The possibility of ODBC connection is obvious.
- There is a need for an internal central database manager It is very urgent necessary to rearrange the storage of files from client hard discs to a file server based system. A central backup and recovery system for all servers is necessary. Decentralised server should have backup in the central computer section for an optimal use of resources if not impossible.
- For new applications the keys for species, varieties, locations and other have to standardized before rewriting of ‘DOS’ programmes
- A central database is necessary to import and to connect all information storing now in Dbase files and other structures. The possibility of ODBC connection is obvious. There is a need for an internal central database manager.
- There is a need to centralise IT-experts of OMMI in the computer section of OMMI and to have at least one crop expert with IT experiences as person in charge for IT questions in each Directorate.
- Establishment of a project group to prepare the introduction of a database for variety registration data is necessary in 2004.
- The statistical software programs have to be harmonised for all species. It is impossible to overtake a computer program system for DUS and VCU testing from another member state of EU. Hungary has to built up an own system.

**Step by step approach**

**Step 1:**
The central ‘Computer Section’ of OMMI has to be defined the main task of this section in co-operation with divisions. This main task has to be confirmed by the General Director as basis of the work in the future

Recommendation:
- IT Co-ordination for hard- and software projects
- IT infrastructure with all external connections
- Internet, Intranet and Proxy-Server
- Firewall-Server
- Email-Server
- Virus-Server
- Database-Server for centralised applications

**Step 2:**
Installation of a provisional COY-U procedure

Possibilities:
- Using ‘DUST for Windows’ from United Kingdom
- Using BSA procedure from Germany as a temporary service in Hannover
- Establishment of OMMI own procedure

Recommendation: Starting with ‘DUST for Windows’ from UK

**Step 3:**
Installation of a provisional denomination checking system for CPVO rules

Possibilities:
- Using BSA procedure if necessary in special cases as a temporary service
- Waiting for new CPVO denomination checking system (2005)
- Establishment of OMMI own procedure

Recommendation: Waiting for new CPVO denomination checking system (2005)

**Step 4:**
Inventory of all ‘DOS’ based programmes of the Variety Testing Division

**Step 5:**
Preparing a concept for introduction of a database for variety registration
- concept for a standard database system in OMMI
- commitment for a standard programming language
  - at least Windows based
  - ODBC technique has to be available
- Definition of all necessities and dependencies
- Pattern: existing variety registration program
- Consideration of all experiences in the work with ‘NORA’ for redrafting

**Step 6:**
Programming of the new database application for variety registration by using the concept

**Step 7:**
Obtaining of necessary hardware and software for development of database driven applications
  - Database server (already available in the Computer section)
  - Database system software (Oracle licence)
  - Developer licence for Windows based programming language

**Step 8:**
Obtaining suitable hardware and software for colleagues working with the new system
  - PC’s with the latest Windows and Office Professional version

**Step 9:**
The central Computer section has the power to concentrate on putting into operation of the central file server as basis of storing of all the files and for developing of a central backup system of OMMI

**Step 10:**
Regarding to the impressions STE the use of external companies or institutions is possible (outsourcing). A small description of important programmes is in the annex 4. For a tender it would be better to add the number of forms or screens and some information of the complexity of the applications.
Central database server, High capacity firewall hardware and software. Specification of supply items will be finalized in the TS, however the indicative list of hardware equipment is as the follows:

1. **Relation database server hardware**
Pentium Xeon with 2 processors, 4 GB memory, 2x36 GB (HDD), RAID5 controller, optical controller card, 10/100 Ethernet card, FDD+CD ROM

2. **Relation database server software**
Operation system and database server software for 50 users. The database server software will be fully compatible with running Oracle 8 software.

3. **High capacity firewall hardware**
Compact firewall/router target hardware X.21 serial interface and 5 db. with 10/100 Mbps Ethernet interface speed

4. **High capacity firewall software**
In the target hardware there are installed integrated operation system, network interfaces, and firewall software. At least 300 users, high security software to comply with OPSEC rules and delivers the network admittance limitation, user identifier, and authentic proposition. It does reliable network title translation. The data screening can use defence to the users by electronic network danger. It has a real time event tracking and it can use virtual personal network (VPN). The centre of the rules system can use all of convenient gift device.

5. **Data recorders**
Handhold data recorders are necessary for reliable field trial data recording. Pre-loaded program makes the work of technical personnel more convenient in the DUS testing. They are easily connected to computers and data can be loaded directly to the central database.

6. **Basic commercial software applications**
Installation of some legal commercial software is necessary to carry out tasks. They are not part of the operation system, but their application enable further software adaptation or modification (i.e. Visual FoxPro, Visual Basic) or necessary for data conversion (i.e. SPSS for Windows) or used for image analysis (i.e. Adobe Creative package, ACDSee)