

Instruction manual of lite version of the program "Multilingual local instrumental system of network purchases optimization, version 1.0" (LVP MLIS NPO 1.0)

Installing LVP MLIS NPO 1.0

1. Copy to a separate folder of your computer disk space a set of files of LVP MLIS NPO 1.0.
2. Check the composition of this set, which should include the following files and folders:
 - boot file **Lite_MLIS_NPO.exe** of the program;
 - boot file **GLS.exe** of utility program of version 1.0 under the name "**Генератор языковых оболочек (ГЯО 1.0)** (Generator of language shells (GLS 1.0))", which allows creating language shells for LVP MLIS NPO 1.0 interface;
 - folder **Cdbg** — it will store a secondary (working) file of a client database of goods (CDBG) under the name **Cdbg_<three-digit code of language of the current program shell>.dat**, used in calculations (now there are two files of the test CDBG for Russian and English shells: **Cdbg_rus.dat** и **Cdbg_eng.dat**). This file is automatically generated when the program starts from the primary CDBG file (with extension xls or dat) placed in the input folder (see below);
 - folder **Data** — it will contain data files (with extension dat) of tasks, solved by the user (there are already placed the data files for three solved tasks, which are presented in two languages);

Note

The installation set of LVP MLIS NPO 1.0 includes three solved test tasks, , which are presented in two options: *Russian* (numbered 01, 02 и 03) and *English* (numbered 04, 05 и 06). Input and output data of these tasks you can look through at the screen, as well as bring out to Excel-files or print.

- folder **Examples of files (disk C)**, that includes two subfolders (input and output) with names specified in the file **Config**. The first of them contains by two options of the primary file of the test CDBG for two their possible file formats (with extensions xls and dat), and the second — four text files of orders for the solved test task numbered 03;
- folder **Excel documents** with the following contents:
 - subfolder **Database**, which contains two files of tabular format Excel (with extension xls) of the test CDBG in Russian and English languages;

- subfolder **Tasks**, in which subfolder **Rus** and **Eng** are stored files of format Excel with input data for three test tasks in Russian and English languages respectively;
- folder **Shells**, that contains files of language shells for the current program interface;

Note

The installation set of LVP MLIS NPO 1.0 includes two files of shells for Russian and English languages: **Shell (NPO 1.0).rus** and **Shell (NPO 1.0).eng**.

- folder **Solving** — in it will be temporarily placed files with input and output data for those tasks which are in the stage of their solving;
- folder **System** with the following contents:
 - subfolder **Template**, that contains initial samples of files **Number** and **Protocol.prt**, which when updating the CDBG primary file will automatically replace files with the same names in root of the folder **System** (see below);
 - **Config** — a configuration file that contains the following information: a) email address of the client (of the program user); b) full name of the *input* folder of the program for a current CDBG file coming from the Center of network trade (CNT); c) full name of the *output* folder of the program for text files of orders for purchasing goods, generated by the program and intended to be sent to their sellers;
 - **Info** — a text file containing three main parameters of your computer: processor type, clock rate and the volume of operative memory;
 - **Languages.txt** — a text file containing a list of possible language shells for the interface of this program;
 - **Number** — file with a number of the last task, which has been created by using the current CDBG;
 - **Programs.txt** — a text file containing names of those programs (including this one), for which may be created language shells by using the utility program ГЯО 1.0 (GLS 1.0);
 - **Protocol.prt** — file of a protocol of tasks, being solved by the user, which holds general information about all existing tasks and their current state;
- folder **User documents** that contains:
 - files of three Russian-language documents in the subfolder **rus**:
 - **Инструкция по эксплуатации ГЯО 1.0.pdf**;
 - **Инструкция по эксплуатации ОВП МЛИС ОСП 1.0.pdf**;
 - **Технические характеристики МЛИС-МСИС ОСП 1.0.pdf**;
 - files of three such English-language documents in the subfolder **eng**:

- **Instruction manual of GLS 1.0.pdf;**
 - **Instruction manual of LVP MLIS NPO 1.0.pdf** — file of this manual;
 - **Technical characteristics of MLIS-MNIS NPO 1.0.pdf.**
3. Create with the help of system means of OS Windows the input and output folders of the programs, which full names are specified in the file **Config**.
 4. Make changes in the **Info** file using OS Windows, specifying there the actual settings of your computer: processor type, clock rate and amount RAM.
 5. For ease of launching the program LVP MLIS NPO 1.0, create a shortcut for its file **Lite_MLIS_NPO.exe** and place it on the desktop of your computer.

Run the program in operation

1. Click on the boot file **Lite_MLIS_NPO.exe** of the program or on its label. At that happens the following:
 - in the absence in the folder **Shells** of any language shells files appears on the screen a warning message that the work in the program LVP MLIS NPO 1.0 for this reason is impossible and it emergency closes;
 - in the presence in this folder of only one language shell file is launched the program, which interface is presented by the language of this shell;
 - in the presence there of two or more files of language shells happens transition to the next instruction item.
2. On the screen opens the window of the program LVP MLIS NPO 1.0 without any records of its interface, and in its center appears a small dialog under the name **Selection of program interface language**. From the drop-down list of this dialog select desired language of program interface and click the button **OK**. At that, the dialog closes and in the program window, which becomes available to work, appear necessary records in language that you just selected. In the same language will be output any text entries in all windows of the program, as well as all information provided in it.

Creating a new task with unique parameters

Notes

1. A new being created task will be automatically assigned the next number.
2. Total for the current CDBG can create up to 10 tasks.
3. During update of the primary CDBG file, placed in the program input folder, all files of the existing tasks will be removed, and the first new task will have the number "01"
4. You can create a new task only when the previous task already is solved. This is due to the fact that any used CDBG has a limited numbers of samples of various goods, the need for which correction becomes known only after solving the current task.

If parameters of a new task of network purchases optimization will differ significantly

from similar parameters of any existing task, do the following:

1. Choose the command **Input of tasks**⇒**Input of a new task**, opening the dialog **Input of task data (step 1 of 8)**, wherein enter the task name (second field of the dialog)
2. Click the button **Forth** in the current dialog. At that on the screen may appear consistently one or two information panels with warning messages, after closing of which happen transition to the dialog **Input of task data (step 2 of 8)**. Set in it the following parameters:
 - amount of funds allocated for purchasing goods (field of the dialog);
 - one of three options of creating alternative groups (AGs) of goods:
 - AG will not be created (left switch of the first group);
 - AG will be created on separate categories of goods (middle switch of the same group);
 - AG will be created on all categories at once (right switch of the same group);
 - presence or absence of the mode of real purchasing goods (second group from two switches).

Note

In the case of specifying the above mode will occur for the solved task the forming of text files of orders for the purchase of goods, as well as automatic correction of the current CDBG by subtracting from it those samples of goods that have been chosen in these orders.

3. Click in the current dialog the button **Forth**, passing to the dialog **Input of task data (step 3 of 8)**, wherein set the following parameters:
 - upper threshold for the utility ratio of a goods sample (field of the dialog);
 - one of two criteria of utility of a goods sample:
 - relative criterion, which is a utility ratio of a sample (left switch);
 - absolute criterion, which is a purchasing worth of a sample, that is calculated as the product of its utility ratio by its cost (right switch).
4. Click in the current dialog the button **Forth**, passing to the dialog **Input of task data (step 4 of 8)**, wherein form alternative groups of goods. This operation is performed in two stages. Firstly you select a goods in the first table of the dialog, and then go to the second table, wherein select the option of buying this item of goods, i.e. its seller and option of delivery to the buyer. The transition between these tables, which by turns are displayed on the screen, occur by clicking on the left button of the dialog.
5. Click in the current dialog the button **Forth**, passing to the dialog **Input of task data (step 5 of 8)**, wherein set for each created alternative group of goods the following parameters:
 - a possible sign of sameness of acquired samples of a goods from this AG (checkbox);

- minimum and maximum numbers of acquired samples of a goods from this AG (two counters);
 - a value of the used criterion of utility for a sample of each goods from the current AG (slider).
6. Click in the current dialog the button **Forth**, passing to the dialog **Input of task data (step 6 of 8)**, wherein consistently set in the dialog tables (transition between them occurs with the left button) the following parameters for goods not included in AGs:
- in the first table — the selected goods itself;
 - in the first table for this goods item:
 - option of its purchase, i.e. a seller of the goods and the option of its delivery to the buyer (checkbox);
 - a value of the used criterion of utility for a sample of the goods (slider);
 - minimum and maximum numbers of acquired its samples (two counters).
7. Click in the current dialog the button **Forth**, passing to the dialog **Input of task data (step 7 of 8)**, wherein you can see the list of selected for acquisition goods and their parameters, and finally adjust for their samples the values of their utility criterion (slider at the bottom right).
8. Click in the current dialog the button **Forth**. At that occurs transition to the dialog **Input of task data (step 8 of 8)**, wherein set the following parameters:
- type of rounding the cost parameters (one of three switches);
 - duration of increment, which presents a step of rounding the cost parameters (first field of the dialog);
 - a protective scaling factor, which provides protection of cost parameters from possible unauthorized access to them by third parties in case of performing the procedure of numerical optimization on another computer with the aim of accelerating the task processing (second field).
9. Click in the current dialog the button **Forth**, passing to the dialog **Input of task data**. Look through in it the main input data of the task and if you are not satisfied by them, then using the button **Back** go to the desired previous dialog and make there necessary correction of the tasks input data. Otherwise, do one of two things:
- at selected by default the switch **later** (it is at the bottom right) click the button **Ready**, causing the program to form two files in the folder **Data**: a common file of the task (**npo_<two-digit task number>.dat**) and its input file (**npo_<task number >_in.dat**);
 - select the switch **at once** (bottom left) and click the button **Ready**, causing this task to be solved at once without using stipulated for this aim the next commands: **Control**⇒**Work with a task protocol** и **Solving of tasks**⇒**Execution of optimization**. At that will be created in the folder **Data** the task output file (**npo_<task number>_out.dat**). Besides, in case of setting for this task the mode of real purchase (the dialog ...**(step 2 of 8)**) will be formed in the program output

(its address is specified in the service file **Config**) the files of orders of acquired goods (<**email address of the seller**>_<**six-digit CDBG code**><**two-digit task number**>.txt). These files the user should send by email to the sellers of these goods by addresses specified in the files names.

Creating a new task with repetitive parameters

If a new task has the same input parameters as some existing task, do the following:

1. Choose the command **Input of tasks**⇒**Input of a new task by data import**, opening the dialog **Input of task data (step 1 of 8)**, where do the following:
 - enter a task name (second field);
 - select format of a file to be imported which contains input data of another task: own format of the program (left switch **DAT**) or standard format Excel (right switch **XLS**);

Note

Mode of import into a new task of input data of another task, been stored in Excel-file, was introduced due to the fact that the program has a mode of export input data of existing tasks into files of Excel type (command **Export of task data to Excel-table** of menu **Output of tasks**).

- when selecting **DAT** do the following:
 - select in the first drop-down list the existing task, input data of which should be copied to the current task;
 - click the button **Import**;
 - when selecting **XLS** do the following:
 - click the button **Import of Excel-file**;
 - in the opened dialog **Open** select on the disk required file (with the extension xls), and click the button of the same name.
2. Moving with the button **Forth** from the current dialog to a next one, look through in all twelve dialogs the input data of a current task and make necessary changes in them (see above Sec. "Creating a new task with unique parameters").
 3. Click the button **Ready** in the last dialog. At that, in the folder **Data** are created two files of the task: general and input.

Correction of task input data

This operation can be performed in two ways:

- during the operation to create a new task (see above);
- by using the command **Input of tasks**⇒**Correction of input data of unsolved task**, that is available for use to such unsolved tasks, which input files have not been copied

to the folder **Solving** for their solution (selection of a task to correct its input is made in the dialog **List of tasks** on the screen when running this command).

Uploading a file with input data of a new task

After creating a new task, you need to copy its input file (with input data of the task) to the folder **Solving** for its subsequent solution (see below). This operation is executed in the following order:

Note

After completing the operation in question concerning to some unsolved task you can not correct its input data.

1. Choose the command **Control**⇒**Work with a task protocol**, opening the dialog **Protocol of tasks**.
2. Select in the dialog upper list the required task, for which the operation in question was not fulfilled (this is indicated by the record "A stage of data input" in line "Task state" of the protocol table).
3. Click the button **Upload the file of task input data**, which in this case becomes unlocked. At that happens the following:
 - in the folder **Solving** appears a duplicate of the input file of current task;
 - in line "Task state" of the protocol table appears record "Waiting for solution";
 - the button **Upload the file of task input data** becomes locked.

Solving tasks

Operation of solving tasks, which input files are placed in the folder **Solving**, is performed in the following order:

1. Choose the command **Solving of tasks**⇒**Execution of optimization**, opening the dialog **Optimization module of MLIS NPO 1.0**.
2. Set the desired mode of processing: *batch* (for solving all group of tasks) or *individual* (for solving only one task), and then click the button **Next**.
3. When working in batch mode, do the following:
 - if necessary, adjust specified parameters of optimization, and then click the button **Next**;
 - click the button **START** at the bottom, resulting in a process of successive solving the tasks of this group, when a name of this button changes to **WORK**;
 - after this button again be called **START**, which indicates the completion of solving the entire group of tasks, close the dialog **Optimization module of MLIS NPO 1.0** by clicking the button **EXIT** (bottom right).
4. When working in individual mode, do the following:

- type in the dialog field a six-digit cipher code of a solvable task and click the button **Next**;
- if necessary, adjust the parameters of optimization scheme, and then click the button **Next**;
- click the button **START** at the bottom, resulting in a process of solving selected task, when a name of this button changes to **WORK**;
- after this button again be called **START**, which indicates the completion of solving the current task, close the dialog **Optimization module of MLIS NPO 1.0** (button **EXIT**).

Connecting a file with task solving results and forming files of orders on purchasing goods

After performing the operation of solving the task you should transfer the file with result of its solution (**npo_<task number>_out.dat**) from the folder **Solving** to the folder **Data**, as well as the to form the files of orders for purchasing goods in case if for this task have been set the mode of real purchase (the dialog ...**(step 2 of 8)**).

This operation is performed in the following order:

Note

After performing this operation concerning some solved task it is impossible its repeated processing. That may be required, in particular, in case of absence of its successful solution due to wrong choice of values of the optimization schemes parameters.

1. Choose the command **Control**⇒**Work with a task protocol**, opening the dialog **Protocol of tasks**.
2. Select in the upper dialog list the required task, which input file was copied to the folder **Solving** (this is indicated by the record "Waiting for solution" in line "Task state" of the protocol table).
3. Click the button **Load the file of task solving results**, which in this case becomes unlocked. At that happens the following:
 - input file of the current task is removed from the folder **Solving**, and its output file is moved from this folder to the folder **Data**;
 - in line "Task state" of the protocol table appears record "Task is solved";
 - the button **Load the file of task solving results** becomes locked;
 - when in the task is specified the mode of real purchase, it will be formed in the program output folder (its address is given in the service file **Config**) the files of orders of acquired goods (<email address of the seller>_<six-digit CDBG code><two-digit task number>.txt). These files the user should send by email to sellers of these goods at addresses specified in their names.

Working with a tasks protocol

A protocol of tasks contains general information about existing tasks of network purchases optimization, being solved by LVP MLIS NPO 1.0 (these data are stored in the file **Protocol.prt** placed in the folder **System**). On the screen displays in tabular form such part of the protocol, which refers to a user-selected task. It contains the following formation:

- cipher and name of this task;
- current state of the task, which can be one of three: " A stage of data input", "Waiting for solution" or "Task is solved";
- dates and times of occurrence for the four different event.

Transition to the mode of work with a tasks protocol is performed by the command **Control⇒Work with a task protocol**, which opens the dialog **Protocol of tasks**. In this window, the following operations can be performed:

- viewing general information about the existing tasks;
- upload the input file a new task, that contains its input data (see above);
- connecting the output file of the task containing the results of its solution (see above);
- removal of those tasks that are no longer necessary for the user (button **Delete the task**).

Canceling the mode of purchasing goods for the solved task

This operation is needed in order to implement the possible refusal of the user from purchasing such set of goods samples, which hwas selected by the program from the used CDBG when solving the task with the set mode of *real* purchasing goods. Such cancel will happen by zeroing a unit sign of presence the indicated mode for the requided solved task. At that will be performed the automatic correction of the numbers of goods samples in this database by adding those previously selected samples, from which the user has refused.

This operation is performed by using the command **Control⇒Cancel of the mode of purchasing goods for solved task**.

Output of task input data

Input data for any existing task of network purchases optimization may be brought out to screen, Excel-file and print. This operation is performed in the following order:

1. Choose the command **Output of tasks ⇒Viewing input data of any task**.
2. In the opened dialog **List of all tasks** select the desired task and click the button **OK**. At that, the current dialog is closed and opens the window **Viewing input data of the task "<task name>"** with tabular input data of the task chosen by you, which can be looked through.
3. To bring out these data to a new Excel document, choose the command **Export of task data to Excel-table** of menu **Output of tasks**, to print them — the command **Print the**

task data of the same menu.

Output of task solving results

Output data for any solved task of network purchases optimization may be brought out to screen, Excel-file and print. This operation is performed in the following order:

1. Choose the command **Output of tasks** ⇒ **Viewing output data of the solved task**.
2. In the opened dialog **List of solved tasks** select the required task and click the button **OK**. At that, the current dialog is closed and opens the window **Viewing solution result of the task "<task name>"** with tabular output data of the task. You can look through them here for any specified threshold of restricting the time or the cost of the network graph execution, clicking in bottom of the the dialog on the label of its appropriate tab.
3. To bring out these data to a new Excel document, choose the command **Export of task data to Excel-table** of menu **Output**, to print them — the command **Print the task data** of the same menu.