

BUILDING THE STUDY CHARACTERISTICS FILE

INTRODUCTION.

The Study Characteristics file is unique for each set of studies. This file contains project order (which projects are upstream and downstream of each other) and project characteristics. Project characteristics are attributes such as storage - elevation tables, power generating curves, channel restriction tables, and project limits such as minimum and maximum flows, full (storage upper bounds (SUB)), and empty (storage lower bounds (SLB)).

A new Study Characteristics file needs to be created each time the number of projects in the system changes or the project characteristics change. Changes to project characteristics in the Study Characteristics file are made by first changing the characteristics in the Master Project Characteristics file. When project characteristic changes are temporary or part of a "what-if" scenario, the changes should be made using record codes 10 and 20 as described in the section on the HYSSR regulator. **Again, changes to the Master files should only be made after coordination with other HYSSR users and with extreme care!**

Building the Study Characteristics file requires two steps. The first step involves building a Study Configuration file specifying projects for this study. The second step actually builds the Study Characteristics file by using the Study Configuration file, the Master Project Characteristics file, and study constants.

13 - 16	Study name
20	Revision number
21 - 32	Project name

A sample of the input data follows:

```
10      3 5NPD 91  LIBBY
10      5 0NPD 91  DUNCAN
10     4915NPD 91  KOOTENAY PLT
10     1924NPD 91  GRAND COULEE
10     6627NPD 91  CHIEF JOSEPH
10      76 6NPD 91  ALOWR GRANITE
10     8318NPD 91  BONNEVILLE
10     166 0NPD 91  TIMOTHY
```

OUTPUT: The program produces two output files. One file is the resulting Study Configuration file in a format which is not readable by the user. This file is one of the input files for the Study Characteristics file. The other file is used by the program to provide error messages and other information which may be useful when program or data problems occur.

EXECUTION ON THE PC: To create the Study Configuration file, have a copy of **STCHAR1.EXE** in the local **C:\HYSSR\PGM** subdirectory. Also since the program executes in batch mode, the control file (confile) named **STCHAR1.CON** must be available in the local **C:\HYSSR\CONFILES** subdirectory and changed to meet the data file naming convention being used. The existing confile format must not be altered. Now type **STCHAR1** while in the **C:\HYSSR\PGM** subdirectory and the program will execute using the dataset names listed in the confile. The resulting Study Configuration file is not user readable. This file is ready to become input to the creation of the Study Characteristics file.

STUDY CHARACTERISTICS FILE

PROGRAM: STCHAR2.EXE

INTRODUCTION: The Study Characteristics file contains information about each project's order in the river system and project characteristics which are specific to the study. The Study Characteristics file also contains information about the years (starting and ending years) and periods (first and last periods) covered by the study. The Study Characteristics (STCHAR) file combines information from the Master files (MASTER1 and MASTER2) and the Study Configuration file (STCHAR1) into one file required by the HYSSR main regulator program and by most of the HYSSR ancillary programs.

INPUT: Creating the Study Characteristics file requires three input files: the Study Configuration file; the Master Project Characteristics file; and a control file. The correct Study Configuration file and Master Project Characteristics file need to be available before a Study Characteristics file may be built.

The program which builds the Study Characteristics file executes in batch mode, so it requires a control file (confile) named **C:\HYSSR\CONFILES\STCHAR2.CON**. This control file defines the names of the Study Configuration file, the input data file, the output file for error messages, the Master Project Characteristics file, and the resulting Study Characteristics file. A sample control file follows:

```
* C:\HYSSR\CONFILES\STCHAR2.CON
*
* Unit 3 is the Study Configuration file from the previous step
* Unit 4 is the input file
* Unit 6 is the output file for error messages
* Unit 7 is the Master Project Characteristics file
* Unit 8 is the resulting Study Characteristics file
*
* FORMAT    T4,I2,T7,A26,T34,A11,T46,A7,T54,A10,T65,I4
*
*
*-----*-----*-----*-----*-----*-----*
*UNIT  FILE NAME                FORMAT      STATUS  ACCESS  RECL
*-----*-----*-----*-----*-----*-----*
*
3   C:\HYSSR\DATA\CONFIG93.STY  FORMATTED   OLD
4   C:\HYSSR\DATA\STCHAR93.IN   FORMATTED   OLD
6   C:\HYSSR\DATA\STCHAR.PRN    FORMATTED   UNKNOWN
7   C:\HYSSR\DATA\CHARS93.MST   UNFORMATTED OLD
8   C:\HYSSR\DATA\STCHAR93.STY  UNFORMATTED UNKNOWN
```

*

The input data file contains two types of record codes. Record codes "01" specifies the study constants to be used for the studies. These constants are input in standard HYSSR format and include:

<u>CONSTANT</u>	<u>DESCRIPTION</u>
NSY	Number of starting year (enter "28" for 1928)
NSP	Number of starting period ("1" is January)
NLY	Number of last year of study
NLP	Number of last period of study
BCP	Beginning of critical period ("2811" is September of 1928)
ECP	End of critical period
CFS	(not currently used)
CON	Conversion factor (units are CFS-DAY/AF or M3/SEC-DAY/M3, where M3 is cubic Meters)
DEC	Thermal decrement in MW. This value is deducted from the primary load every period.
DP1	First depletion year for natural flows (see Glossary) - type "70" for 1970
DP2	Second depletion year for natural flows - type "20" for 2020
GEN	Power generation unit indicator: 0 = megawatts, 1 = kilowatts
IRS	Type of study: (see Glossary) 0 = Continuous, 2 = Refill
LPP	Lines per page for line printer output
MET	Unit indicator for printed output: 0 = English, 1 = Metric
MOK	Power computation conversion factor. Power equation: $MW = (Q)(H)/(MOK)$ where MOK = 11,814 (English) = 101.934 (Metric)
TOL	Tolerance in Mw within which the load must be met.

All of these constants may be modified at run-time when the HYSSR main regulator program is executed.

The second type of input to the Study Characteristics file are on record code "05". These records also use the standard HYSSR record format and contain the period names to be used for this set of studies. Valid period names are found below. It is important to note that once the periods for a study have been established, they may not be changed without creating a new Study Characteristics file.

VALID HYSSR PERIOD IDENTIFIERS

<u>PERIOD NAME</u>	<u>IDENTIFIER</u>	<u>JULIAN DATE</u>
JAN 15	JA1	015
JAN 31	JAN	031
FEB 14	FB1	045

FEB 28	FEB	059
MAR 15	MR1	074
MAR 31	MAR	090
APR 15	AP1	105
APR 30	APR	120
MAY 15	MY1	135
MAY 31	MAY	151
JUN 15	JN1	166
JUN 30	JUN	181
JUL 15	JN1	196
JUL 31	JUL	212
AUG 15	AG1	227
AUG 31	AUG	243
SEP 15	SP1	258
SEP 30	SEP	273
OCT 15	OC1	288
OCT 31	OCT	304
NOV 15	NO1	319
NOV 30	NOV	334
DEC 15	DC1	349
DEC 31	DEC	365

Bold type indicates periods used for 14 periods per year studies.

A sample of the input data follows:

01	NSY	28NSP	9NLY	78NLP	8
01	BCP	2811ECP	3202IRS	2DEC	0
01	TOL	10MOK	11814DP1	80DP2	30
01	LPP	55MET	0CON	.504167TRC	0
05	JAN	FEB	MAR	AP1	
05	APR	MAY	JUN	JUL	
05	AG1	AUG	SEP	OCT	
05	NOV	DEC			

OUTPUT: There are two output files generated by this program. One is the Study Characteristics file which is in a format not readable by the user. A program called **LISTCHAR** is used to list out the contents of the Study Characteristics file. The second output file contains error messages and other information to help the user run the program correctly.

EXECUTION ON THE PC: To create the Study Characteristics file, have a copy of **STCHAR2.EXE** in the local **C:\HYSSR\PGM** subdirectory. Also since the program executes in batch mode, the control file (confile) named **STCHAR2.CON** must be available in the local **C:\HYSSR\CONFILES** subdirectory and changed to meet the data file naming convention being used. The existing confile format must not be altered. Now type **STCHAR2** while in the **C:\HYSSR\PGM** subdirectory and the program will execute using the dataset names listed in the confile. The resulting Study Characteristics file is in a format not readable by the user. This file becomes input to the **LISTCHAR** program, the main HYSSR regulator program, and many of the HYSSR ancillary programs.

LISTING THE STUDY CHARACTERISTICS FILE

PROGRAM: LISTCHAR.EXE

INTRODUCTION: The program, **LISTCHAR.EXE**, is available to read the Study Characteristics file (which is not in a user readable format) and list the data for the projects in the study to an output file. This output file may be directed to a printer or to a named file.

INPUT: This listing program executes in batch mode, so a control file (confile) named **LISTCHAR.CON** is required in the local **C:\HYSSR\CONFILES** subdirectory. This control file defines the names of the input file, the output file, and the Study Characteristics file. A sample control file follows:

```
* C:\HYSSR\CONFILE\LISTCHAR.CON
*
* Unit 5 is the input data file
* Unit 6 is the file where the output data will be written
* Unit 7 is the name of the Study Characteristics file being read
*   FORMAT  T4, I2, T7, A26, T34, A11, T46, A7, T54, A10, T65, I4
*
*-----*
*UNIT  FILE NAME                FORMAT      STATUS  ACCESS  RECL
*-----*
*   5  C:\HYSSR\DATA\LISTCHAR.IN  FORMATTED   OLD
*   6  C:\HYSSR\DATA\LISTCHAR.PRN FORMATTED   UNKNOWN
*   6  PRN
*   7  C:\HYSSR\DATA\STCHAR93.STY UNFORMATTED OLD
*-----*
```

The input file indicates the option to be used for listing the contents of the Study Characteristics file. When the desired option is storage - elevation tables, the user may request storage - elevation tables for specific projects or for all projects. Requesting storage - elevation tables for all projects (no input records specifying project numbers) creates a huge file, so it is generally recommended that the user specify only the projects required.

All input records for LISTCHAR have "88" in columns 1 - 2. The option is input in **column 32**. The available options are:

option = 1 prints only the storage/elevation tables

option = 2 prints the contents of the Study Characteristics file only

(this is the most used option)

option = blank prints both of the above

The input records specifying which projects should have storage - elevation tables written also use record code "88". The project number must be in **columns 8 - 10** with one project number per record.

A sample input follows:

```
88                1
88                3
88                10
88                19
```

OUTPUT: The output for this program is a list of the contents of the Study Characteristics file and/or the project storage - elevation tables. The output may be directed to a file or directly to the printer at run time. A sample output is found on page 10.

EXECUTION ON THE PC: To execute this program have a copy of **LISTCHAR.EXE** available in the local **C:\HYSSR\PGM** subdirectory. Since the program executes in batch mode, a control file named **LISTCHAR.CON** must be available in the local **C:\HYSSR\CONFILES** subdirectory. Now type **LISTCHAR** while in the **C:\HYSSR\PGM** subdirectory and the program will execute using the dataset names listed in the confile.