

VI.4.2 SHEF DATA TRANSFER USING PROGRAMS SHEFPARS AND SHEFPOST

Purpose

The Standard Hydrometeorological Exchange Format (SHEF) [[Hyperlink](#)] has been adopted by the National Weather Service as the standard format for the encoding of hydrologic data.

In order for SHEF data to be available for use in the Operational Forecast System it must be decoded and written to the Preprocessor Data Base (PPDB) [[Hyperlink](#)]. The decoding and posting are done by separate programs which are run in succession.

Program SHEFPARS [[Hyperlink](#)] decodes (parses) the SHEF input and writes the data to the SHEFOUT file[[hyperlink](#)].

Program SHEFPOST [[Hyperlink](#)] writes (posts) the data by the reading the data from the SHEFOUT file and writing it to the PPDB.

Input Summary

<u>Card</u>	<u>Field</u>	<u>Format</u>	<u>Contents</u>
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The input for program SHEFPARS is as follows (card 1 input is free format): 1/

1	1	A4	Optional card; enter 'PRIN' to print the contents of the SHEFOUT file
2+			SHEF messages to be decoded

The input for program SHEFPOST is as follows (all input is free format): 1/

1	1		'POST'
	2	I	Indicator to specify the use of the revision code: 0 = use revision code in SHEF messages as intended (default) 1 = ignore the revision code in SHEF messages (i.e. always post data even if a value is already in the PPDB)
	3	I	Indicator whether certain error and warning messages are to printed: 0 or blank = print all messages 1 = do not print errors and warnings for station not found and data type not found

Notes:

1/ A '\$' in the first field of a card indicates the whole card is a

comment.

Program Execution Information

See Chapter I.2 [[Hyperlink](#)] for program execution information.

Setting Default Dates

When the year is not explicitly coded in the date field of a SHEF message, the year is assigned using the current system date. If a year other than the current system date is to be used it can be specified in the SHEFPARM file [[Hyperlink](#)].

SHEF Posting Rules

The following rules are followed when posting decoded SHEF values from the SHEFOUT file to the PPDB:

- o Data on the PPDB can only be overwritten when the revision code is 'on' except in the case of data entered with the SHEF code PPPRZZZ or if it is specified that the revision code be ignored.
- o For PPPRZZZ, which corresponds to data types PP24 and PPSR, the rules for changing an existing value are:
 - If the ending hour of the value being written is prior to the existing value then the existing value is not changed even if the revision indicator is set to one.
 - If the ending hour of the value being written is the same as the existing value then the existing value is only changed when the revision indicator is set to one.
 - If the ending hour of the value being written is after the existing value then the existing value is always changed even if the revision indicator is set to zero.
- o The SHEF source code is usually ignored except for observed SNOTEL minimum temperatures and forecast data (type code = F).
- o Any data with a probability code is rejected.
- o The SHEF data qualifier is ignored.
- o The SHEF station identifier is used as the PPDB station identifier.
- o The creation date of the data is ignored.
- o The data source is ignored.
- o The items on the SHEFOUT file are generally processed one at a

time and written to the PPDB. There are two exceptions to this rule. First, for a string of time series data, all the elements of the string are written to the PPDB at one time. Second, for forecast data (type code = F), succeeding items in the SHEFOUT file are examined and as long as the station identifier, physical element, source code, extremum code and revision code are the same, the data values are all written to the PPDB at one time.

Tables 1 and 2 contains the information used to translate the SHEFOUT file contents to a PPDB data type and to determine if the observation time is compatible with time intervals that can be stored on the PPDB.

Output Data

The output from the SHEF decode and post programs consists of printer output (SHEF messages, error messages, contents of SHEFOUT file if requested and a summary of the values posted to the PPDB) and data values written to the PPDB.

Table 1. SHEF to PPDB translation information for daily data types

		----- SHEFOUT File Contents -----				
PPDB Data Type	Expanded SHEF Parameter Code	PE Code	DUR Code	Observation <u>1</u> / Time	Type Code	EXTRM Code
PPDB data types written using routine WPD1S						
PP24	PPDRZZZ	PP	2001/1024	HZ-2,HZ+4 <u>2</u> / <u>3</u> /	R	Z
PP24	PPPRZZZ	PP	5004	<u>4</u> /	R	Z
PP06	PPQRZZZ	PP	1006	HZ+6*n n=0,3	R	Z
PPO3	PPTRZZZ	PP	1003	HZ+3*n n=0,7	R	Z
PPO1	PPHRZZZ	PP	1001/0060	HZ+n n=0,23	R	Z
TN24	TAIRMNZ	TA	0	HZ-8,HZ+2	R	N
TN24	TAIRZNZ	TA	0	HZ±2	R	N
TN24	TAIRZPZ	TA	0	HZ±2	R	P
TX24	TAIRZXZ	TA	0	HZ-8,HZ+2	R	X
TAO1	TAIRZZZ	TA	0	<u>5</u> /	R	Z
TAO3	TAIRZZZ	TA	0	<u>5</u> /	R	Z
TAO6	TAIRZZZ	TA	0	<u>5</u> /	R	Z
TA24	TADRZZZ	TA	2001/1024	HZ±2	R	Z
TD24	TDDRZZZ	TD	2001/1024	HZ±2	R	Z
US24	USDRZZZ	US	2001/1024	HZ±2	R	Z
US24	ULDRZZZ	UL	<u>6</u> / 2001/1024	HZ±2	R	Z
RC24	RCDPZZZ	RC	2001/1024	HZ 2	P <u>7</u> /	Z
RP24	RPDRZZZ	RP	2001/1024	HZ±2	R	Z
RI24	RIDRZZZ	RI	2001/1024	HZ±2	R	Z
PPDB data types written using routine WPD1SF						
TFMN	TAIFZNZ	TA	0	HZ	F	N
TFMX	TAIFZXZ	TA	0	HZ HZ+12 <u>8</u> /	F	X
PPDB data type written using routine WPDSS						
PPSR <u>9</u> /	PPDRZZZ	PP	2001/1024	HZ±2	R	Z
PPSR	PPPRZZZ	PP	5004	<u>4</u> /	R	Z

Notes:

1/ SHEF observation times for daily data types are first rounded to the nearest hour.

2/ HZ signifies the ending hour of a hydrologic day in Z time (normally 12Z).

3/ HZ ± n observation time ending hours are posted to the PPDB as an

observation time ending hour of HZ.

- 4/ SHEF code PPP indicates incremental precipitation since the previous 7 AM local time, thus, any observation time ending hour is okay. Six-hourly values (i.e., HZ, HZ+6, HZ+12, and HZ+18) are allowed a ± 2 hour window. Three-hourly values (i.e., HZ+3, HZ+9, HZ+15, HZ+21) must match exactly. Thus the time for which the data is posted is as follows:

<u>Observation Time</u>	<u>Posted Time</u>
HZ ± 2	HZ
HZ + 3	HZ + 3
HZ + 6 ± 2	HZ + 6
HZ + 9	HZ + 9
HZ + 12 ± 2	HZ + 12
HZ + 15	HZ + 15
HZ + 18 ± 2	HZ + 18
HZ + 21	HZ + 21

- 5/ If only one instantaneous temperature value is being written to the PPDB, it is always written as TA01. TA03 and TA06 are only used when a time series is being written and the time interval is 3 or 6 hours, respectively. Also, for TA03 and TA06, the observation ending hours must be compatible with HZ.
- 6/ UL data are divided by 24 to get wind speed.
- 7/ Sky cover data must be processed to get a weighted sky cover value for evaporation computations.
- 8/ HZ+12 maximum temperature forecasts are posted to the PPDB as if the observation time was the end of the hydrologic day.
- 9/ A stranger report is differentiated from a regular station by the SHEF station identifier.

Table 2. SHEF to PPDB translation information for RRS data types

		----- SHEFOUT File Contents -----				
PPDB	Expanded SHEF	PE	DUR	Observation <u>1/</u>	Type	EXTRM
Data Type	Parameter Code	Code	Code	Time	Code	Code
PPDB data types written using routine WPDRRS						
AESC	SAIRZZZ	SA	0	any	R	Z
DQIN	QDIFZZZ	QD	0	any	F	Z
DQIN	QDIRZZZ	QD	0	any	R	Z
DQME	QD_FZZZ	QD	<u>1/</u>	any	F	Z
DQME	QD_RZZZ	QD	<u>1/</u>	any	R	Z
FBEL	HFIRZZZ	HF	0	any	R	Z
FGDP	GDIRZZZ	GD	0	any	R	Z
GATE	NGIRZZZ	NG	0	any	R	Z
ICET	ITIRZZZ	IT	0	any	R	Z
LAKH	HKIRZZZ	HK	0	any	R	Z
LELV	HLIRZZZ	HL	0	any	R	Z
PELV	HPIRZZZ	HP	0	any	R	Z
QIN	QRIRZZZ	QR	0	any	R	Z
QME	QR_RZZZ	QR	<u>1/</u>	any	R	Z
RQGM	QG_RZZZ	QG	<u>1/</u>	any	R	Z
RQIM	QI_RZZZ	QI	<u>1/</u>	any	R	Z
RQIN	QIIRZZZ	QI	0	any	R	Z
RQME	QT_FZZZ	QT	<u>1/</u>	any	F	Z
RQME	QT_RZZZ	QT	<u>1/</u>	any	R	Z
RQOT	QTIFZZZ	QT	0	any	F	Z
RQOT	QTIRZZZ	QT	0	any	R	Z
RQSW	QSIRZZZ	QS	0	any	R	Z
RSTO	LSIRZZZ	LS	0	any	R	Z
SNOG	SDIRZZZ	SD	0	any	R	Z
SNWE	SWIRZZZ	SW	0	any	R	Z
STG	HGIRZZZ	HG	0	any	R	Z
TWEL	HTIRZZZ	HT	0	any	R	Z
TWSW	HWIRZZZ	HW	0	any	R	Z
ZELV	HZIFZZZ	HZ	0	any	F	Z
ZELV	HZIRZZZ	HZ	0	any	R	Z

Notes:

1/ Any duration from 1 to 24 hours is to be accepted. Durations are rounded to the nearest hour. Durations of less than 30 minutes are treated as an instantaneous observation.