

Purpose

MOD SSARREG sets the current reservoir regulation plan for Operation SSARRESV.

The regulation plan is specified through a series of entries that indicate the regulation method and the associated date and value. All the regulation plans are identified by an effective date and Operation name. Only one effective date out of all the regulation plans can be in effect in a Segment during a forecast run. The plan that is used is the one with the closest effective date prior or equal to the last hour of observed data (Technique LSTCMPDY). If two plans have the same effective date and Operation name specification then the last entered is used.

See Sections II.4-SSARRESV and V.3.3-SSARRESV for more details on the regulation options.

Format

The format of the SSARREG MOD is:

.SSARREG effectivedate

$$\text{segid} \begin{bmatrix} \text{US} \\ \text{DS} \end{bmatrix} \left\{ \text{keyword} \begin{bmatrix} \text{timeint date \{datavalues\}} \\ \{date datavalue\} \end{bmatrix} \right\} / \text{opname}$$

where effectivedate is the effective date of the data  
 segid is the Segment identifier  
 US indicates data is for the upstream reservoir  
 DS indicates data is for the downstream reservoir  
 keyword is the regulation method; valid keywords are:  
     FREEFLOW - free flow (lake routing)  
     SETQ - outflow specified (units of CFS or CMS)  
     SETH - reservoir elevation specified (units of FT or M)  
     SETS - reservoir storage specified (units of ACFT or TCUM)  
     SETDQ - change in storage specified (units of CFSD/DAY or CMSD/DAY)  
     SETDH - daily change in elevation specified (units of FT/DAY or M/DAY)  
     SETDS - daily change in storage specified (units of ACFT/DAY or TCUM/DAY)  
 timeint is the data time interval

date is the date of the data

The maximum number of data points is 300 for the upstream reservoir and 300 for the downstream reservoir.

The optional entry 'US' is only used when the SSARRESV Operation contains two reservoirs (used when the outflow from the upstream reservoir is controlled by backwater effects from the downstream reservoir). The US option is used to specify the regulation plan for the upstream reservoir and the DS option is used to specify the regulation plan for the downstream reservoir. If both the US and DS plans are used then both plans are assumed to have the same effective date and Operation name and should be entered first with the US plan followed by the DS plan. For a single reservoir only one regulation plan with the DS option is needed. If no option is entered the DS option will be used as default.

The regulation time must be in ascending order but consecutive values of equal regulation times are allowed. A pair that brackets a given run time in a forecast run will be used to generate the regulation option. If several equal regulation times are specified and are equal to a specific run time then the regulation option corresponding to the first regulation time will be used. The general reservoir regulation rules for a computational interval starting at time t. and bracketed by regulation times T1 and T2 are as follows:

1. If no regulation option is specified:
  - o If the discharge/elevation curve is available FREEFLOW is used.
  - o If the discharge/elevation curve is not available inflow will be passed.
2. If the options at T1 and T2 are the same the regulation value is linearly interpolated between the values specified at T1 and T2.
3. If the regulation options at T1 and T2 are different:
  - o If the specified option at T2 is SETH or SETS the regulation option at T2 is used and the regulation value is linearly interpolated using the computed value from t and the specified value at T2.
  - o If the specified option at T2 is neither SETH nor SETS FREEFLOW is used.

A value does not have to be specified in the case of FREEFLOW. If a value is specified in this case it is not used.

Only SSARREG entries that are beyond the last observed data (outflow or elevation) are used by the SSARRESV Operation (i.e. the regulation plan typically applies only to the Operation of the reservoir during the forecast period).

#### Example

In this example outflow is specified starting at 18Z on August 2nd.

The SETQ specification will continue for 12 6 hour periods with a discharge of 3000 CFS (assumes MODUNITS technique is set to English units) for the first day and 4000 CFS for the next two days. Outflow will then be increased linearly to 6000 CFS at 12Z on August 6th and then to 8000 CFS at 0Z on August 7th. Note that regulation option is changed from SETQ at 0Z to SETDH at 12Z on August 7th; free flow will occur during those periods according to the general regulation rules. Beginning at 12Z on August 7th the reservoir elevation will increase at a rate of 3 FT per day until 12Z on August 9th. The reservoir elevation will change linearly from a positive rate of 3 FT per day at 12Z on August 9th to a negative rate of 2 FT per day at 0Z on August 10th. At 0Z on August 10th the reservoir elevation will decrease at the rate of 2 FT per day until 0Z on August 12th. From 12Z on August 12th the reservoir will be in a free flow condition for the rest of the run. Note that regulation option is changed from SETDH at 0Z to FREEFLOW at 12Z on August 12th; free flow will occur at 0Z rather than at 12Z on August 12th according to the general regulation rules.

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.SSARREG 0802
  BONI1 US SETQ 6 080218Z 4*3000. 8*4000. &
        SETQ 0806 6000. 080700Z 8000. &
        SETDH 0807 3. 0809 3. 081000Z -2. 081200Z -2 &
        FREEFLOW 0812 &
  DS SETQ 6 080218Z 4*3000. 8*4000. &
        SETQ 0806 6000. 080700Z 8000. &
        SETDH 0807 3. 0809 3. 081000Z -2. 081200Z -2 &
        FREEFLOW 0812
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