Phil Weinstein / Accomplishments -- September 2014 -- Edit 10-01-2014

| **General Development Accomplishments** |
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[I.A] New/Enhanced Software / BOR Truckee
   Teacup diagram and Output Visualization / Design and Development
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After designing, last month (August 2014), a new RiverWare "Output Canvas" output device supporting animated "Teacup" and "Flow Line" graphics, a demonstration level of Teacup support was implemented in September. All developed features are supported in the Output Canvas configuration dialog which includes a "Canvas Preview" graphics window in which individual teacup graphics can be repositioned by dragging. The set of Teacups is composed and configured using object tree and property editor list panels -- similar to the configuration controls for RiverWare Model Reports. Teacups -- which have a "bar chart" graphical design rather than a trapezoidal design -- currently include the following graphical components:

1. A "maximum" entity (outer rectangle) with provisions to use the maximum volume from a reservoir's Elevation Volume Table (using a general algorithm), the maximum value within any series, or a scalar slot.
2. A "current" entity (inner rectangle) associated with any series or periodic slot.
3. One or more "markers" (horizontal lines) associated with any series, periodic, or scalar slot.
4. A vertical axis with numbered tick marks at the top (maximum) and bottom (always zero).
5. An optional "bounding box" with partially opaque background and optional frame.
6. A textual label using a configurable font.

Additional implemented features include:

1. A timestep slider and animation controls.
2. Image export (to an image file) and copy (to the system clipboard) -- just for data at one timestep.
3. The ability to create a large set of teacups from existing simulation objects in a single operation. Teacups are initially placed "proportionally" to their locations in the RiverWare workspace's simulation view.
4. A "Log" panel (tab) reporting the status of teacup rendering (e.g. indicating missing slot associations).

The design for this development work is documented here:

- RiverWare Output Canvas: Tea Cup and Flow Animations: Design 3 [31 pp.]
  R:\doc\Output\OutputCanvas\2014\OutputCanvDesign3-2014-08-25.docx

A more complete description of the completed Teacup development is documented here:

- RiverWare Output Canvas / Teacup Development Report -- Sept. 2014 [5 pp.]
  R:\doc\Output\OutputCanvas\2014\OutputCanvSepDevelop-2014-09-20.docx

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[I.A] New/Enhanced Software / BOR Truckee
    Object Account Summary: Option to Show Only Non-Zero Slots
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This enhancement applies to three accounting series data dialogs: The Object Account Summary, the Edit Account Dialog, and the Exchange Balance Dialog. These three dialogs used to show a "Show empty Slots" checkbox below the series data table. This has been replaced with an option menu presenting these three choices:

- Show: [ All slots ]
- Show: [ Only slots with values ]
- Show: [ Only slots with non-zeros ]

In most cases, all of the series' timesteps are considered.  But in the Object Account Summary "Timesteps" column mode, only the selected (displayed) timesteps are considered.

In the case of the Object Account Summary Dialog, the temporary "SUM" slot is always shown, regardless of this "Show" option.  That is, selecting [Show:] "Only slots with non-zeros" does not cause that "SUM" row or column to be hidden if it has all zeros.  The "Show" option applies only to the Account series slots, i.e. the slots from which the sum is computed.

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[I.A] New/Enhanced Software / TVA [#10] Preschedule SCT Enhancements
    Feature Design and Development Planning
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Analysis, design and development estimates were prepared to support TVA's upcoming FEWS integration -- primarily SCT enhancements to support "Preschedule" features currently implemented as an Excel application -- but also two new plotting features. Documents were prepared for these enhancements:

1. Custom Time-Aggregation Summary Rows (only in the aggregated vertical timestep view)
2. Support for multiple Series Slots tabs
3. A second Series Data Table (on each Series Slots tab) to present non-scrolled slot columns (only in the vertical timestep views)
4. Automatic re-evaluations -- at single timesteps -- of RPL Expression series slots shown in the SCT.
5. SCT/Plotting: Ability to swap different simulation objects into designated plot page curves based on the SCT's cell selection.
6. Plotting: Symbolic Plot Time Ranges, dynamically applied each time a plot page is shown.

Note that items 2 or 3, above, both individually address a particular Preschedule SCT requirement; we wouldn't have to implement both.

This first document provides a design and development analysis for the first five items above. The second brief document describes the last item:

1. SCT enhancements to support TVA's Preschedule Editor functionality [21 pp.]
   R:\doc\sct\2014\TvaPreschedEdit\SctPreschedDesign-Sept2014.docx

10-1-2014

2. Plot Page Time Range Enhancement for TVA FEWS Integration [2 pp.]
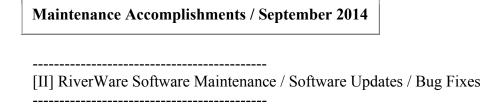   R:\doc\plotting\TimeRangeFeatures\2014\SymbolicPlotTimeRanges-Sept2014.docx


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[I.A] New/Enhanced Software / TVA [#10] Preschedule SCT Enhancements
  SCT: Custom Time-Aggregation Summary Rows
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Development for first enhancement among those designed and documented for SCT support of TVA Preschedule features (*see above*) was started in September. This is addition of Custom Time-Aggregation Summary Rows in the SCT's aggregated vertical timestep view. In September, the configuration dialog, configuration data persistence, and *display features* for most of the "computed" and "slot reference" custom summary rows were implemented. The following types of summary rows can be displayed at the end of each time aggregation -- e.g. daily aggregation of hourly series data:

- Sum
- Maximum
- Minimum
- Average
- Difference -- of the prior two rows.
- Slot Reference -- data from a slot identified from the simulation object (or associated data object) of the SCT column's slot, having the local slot name identified with the summary row configuration. In the example of daily aggregation of hourly series data, examples of supported slot references include: a daily series slot, a periodic slot, or a scalar slot. The unit type of the reference slot must mach the unit type of the slot in the SCT column (or else the slot reference row cell will be blank). Slot reference values are displayed with the units and precision of that SCT column slot.

A horizontal divider having a selectable color can optionally be shown above any custom aggregation summary row.

Development in September included automatic updates to custom aggregation summary row cells -- as a result of changes to values of the slots on which summary rows depend.


**Maintenance Accomplishments / September 2014**


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[II] RiverWare Software Maintenance / Software Updates / Bug Fixes
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The following bugs were fixed:

- Bug 5536: RPL predefined function: GetTableColumnVals CRASH with acre-ft/month units.
- Bug 5540: Object Account Summary dialog: incorrect number of time columns after switching the column mode.
- Bug 5542: Model Run Analysis dialog, the R flag was not displayed.

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