How Does the Interpolation Work in Loadshapes?

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Question

I got a stair-stepped solution when I executed with a Loadshape defined with hourly data. Can I get the program to interpolate between the points?

Answer

The OpenDSS LOADSHAPE class uses two different types of interpolation depending on how you define the shape.

The most common way of defining a loadshape is to enter fixed interval data. This is the default and I believe the INTERVAL property defaults to 1 hour. You can set it to another value or to 0. The SINTERVAL and MINTERVAL properties were added some time ago to facilitate defining intervals in second or minutes, respectively.

When the INTERVAL property is greater than 0, fixed interval data are expected for the MULT and QMULT properties. If you are making CSV files for this kind of data, you would put one numeric value per line in the file. The load multiplier interpolation algorithm assumes the value REMAINS CONSTANT over the entire interval for fixed interval data. The HOUR array property is ignored for fixed interval data.

This gives a stair-step appearance to the loading solution if you use a time step that is smaller than the interval. No interpolation is done.

If you would prefer the program did LINEAR INTERPOLATION between the points, you would define INTERVAL=0. Then you must supply both the time and multiplier values for the loadshape using the HOUR, MULT, and QMULT array properties.

Alternatively, you may use the CSVFILE, DBLFILE, or SNGFILE properties to define the curve as a text CSV file, file of doubles, or file of singles, respectively. With this approach you would enter both the time in hours and the multiplier values. So a CSV file, for example, would have two values per line separated by a comma or whitespace.

The variable interval interpolation could be a little bit slower than the fixed interval data because there is more work to do to compute the factor.

--Rdugan 17:10, 1 September 2011 (UTC)

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