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| Sandia National Laboratories |
| SNL-SWAN BetaTest User’s Manual |
| DRAFT |
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# INPUT

This is the SNL-SWAN input file, which has the same settings as SWAN, as specified in the SWAN user’s manual, with the addition of the SET obcase line that sets which version of SNL-SWAN is run.

## SET obcase=0

Baseline SWAN, uses the SWAN constant transmission obstacle formulation.

## SET obcase=1

SNL-SWAN Alpha Power Matrix, uses the WEC power matrix to calculate the effective transmission coefficient, a constant value across all frequencies.

## SET obcase=2

SNL-SWAN Alpha RCW, uses the WEC power matrix to calculate the effective transmission coefficient, a constant value across all frequencies.

## SET obcase=3

SNL-SWAN Beta Power Matrix, uses the WEC power matrix to calculate the transmission coefficient for each frequency bin. Requires Power.txt

## SET obcase=4

SNL-SWAN Beta RCW, uses the WEC power matrix to calculate the transmission coefficient for each frequency bin. Requires Relative\_Capture\_Width.txt

## Example SNL-SWAN INPUT File

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# Relative\_Capture\_Width.txt

If SNL-SWAN is run with option 4, the Relative\_Capture\_Width.txt file is required to run. This is the WEC power performance in the form of a relative capture width curve, in two vertical columns containing one the period and the one with Relative Capture Width Curve (RCW) value. This curve can be directly copied from excel into a \*.txt file, see Example Relative\_Capture\_Width.txt File section.

|  |  |
| --- | --- |
| Tp [s] | RCW [-] |
| 3 | 0.05 |
| 4 | 0.13 |
| 5 | 0.22 |
| 6 | 0.41 |
| 7 | 0.53 |
| 8 | 0.70 |
| 9 | 0.86 |
| 10 | 0.90 |
| 11 | 0.97 |
| 12 | 0.84 |
| 13 | 0.77 |
| 14 | 0.53 |
| 15 | 0.38 |
| 16 | 0.32 |
| 17 | 0.30 |

Figure 1 – Sample WEC RCW Curve from Excel and plotted

## Wave Periods

The wave period should be defined in seconds. The wave periods should be defined in the first column of the Relative\_Capture\_Width.txt file.

## Relative Capture Width

The RCW is a non-dimensionalized power ratio defining the WEC’s power performance. The RCW values should be defined in the second column of the Relative\_Capture\_Width.txt file.

## Example Relative\_Capture\_Width.txt File



# Power.txt

If SNL-SWAN is run with option 2, the Power.txt file is required to run. This is the WEC power performance in the form of a power matrix. The file starts with the WEC width, then the number of wave heights, followed by a list of wave heights, then the number of wave periods, followed by the list of wave periods, and finally the WEC power matrix is defined. These values can be directly copied from excel into a \*.txt file, see Example Power.txt File section.



Figure 2 - Sample WEC Power Matrix from Excel

## WEC Width

The WEC width value can either be the WEC’s physical dimension, or it’s capture width. This term is used to calculate the incident power available to the WEC based on SNL-SWAN’s incident power flux at the WEC location. This is the first term defined in the Power.txt file.

## Wave Heights

The number of wave heights used to define the WEC power matrix is first defined, and then the wave heights defining the WEC power matrix are specified. Wave heights should be defined in meters. This is the second term defined in the Power.txt file.

## Wave Periods

The number of wave periods used to define the WEC power matrix is first defined, and then the wave periods defining the WEC power matrix are specified. The wave periods should be defined in seconds. This is the third term defined in the Power.txt file.

## WEC Power Matrix

The WEC power matrix should be defined in kW. This is the last term defined in the Power.txt file.

## Example Power.txt File

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