Simple Circuit

SimpleCircuit

Figure 1. Circuit Model

This is a simple example to illustrate basic OpenDSS scripting and program execution for common circuit elements.

From the *Examples>Simple* folder open *SimpleTest.DSS* and execute the script by

1. Select the lines from Clear through Solve
2. Right click on the screen and execute Do Selection
3. Click on Summary in the lower left corner

How many iterations did it take to solve this power flow?

How many devices are in this circuit? Nodes?

1. There are three “Show” commands that generate reports. Select and execute these.
2. From the Power report, what are the losses in the circuit?
3. Make a new script window (ctrl-N)
4. Type **Visualize currents "Transformer.TR1**" into that window and execute.
5. What is the neutral current?
6. Execute the 3 commands in the Block Comment section. This adds a 1-phase load (connected L-L), changes the PF and then verifies the change (in the Results windows)
7. Execute a Solve and repeat the Visualize command. Now what is the neutral current?
8. How do we get neutral current if the only 1-phase load is L-L?
9. Execute the **Show power kva elem** command again. How do you explain the powers in Load2?
10. Add a Generator to the problem:   
    **New Generator.DG1 Bus1=LoadBus kV=12.47 kW=500 PF=1.0**
11. Execute a Solve command and inspect the results again. What is the total power at the source? Compare to the powers in each phase.
12. Execute the Visualize Current command again for the transformer. What is the neutral current now?

The Script:

C**lear**

**New Circuit.Simple**

**Edit Vsource.Source BasekV=115 pu=1.05 ISC3=3000 ISC1=2500 !Define source V and Z**

**New Transformer.TR1 Buses=[SourceBus, Sub\_Bus] Conns=[Delta Wye] kVs= [115 12.47]**

**~ kVAs=[20000 20000] XHL=10**

**New Linecode.336ACSR R1=0.058 X1=.1206 R0=.1784 X0=.4047 C1=3.4 C0=1.6 Units=kft**

**New Line.LINE1 Bus1=Sub\_Bus Bus2=LoadBus Linecode=336ACSR Length=1 Units=Mi**

**New Load.LOAD1 Bus1=LoadBus kV=12.47 kW=1000 PF=.95**

**Set voltagebases=[115 12.47]**

**Calcvoltagebases**

**Solve ! solves the snapshot power flow**

**Show Voltage LN Nodes**

**Show power kva elem**

**Show current elem**

**/\*\*\*\*\* Block Comment \*\*\*\*\*\***

**New Load.LOAD2 phases=1 Bus1=LoadBus.2.3 kV=12.47 kW=500 PF=.90**

**Load.Load2.PF = .85 ! Change the load power factor**

**? load.load2.pf ! query the PF to check**

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