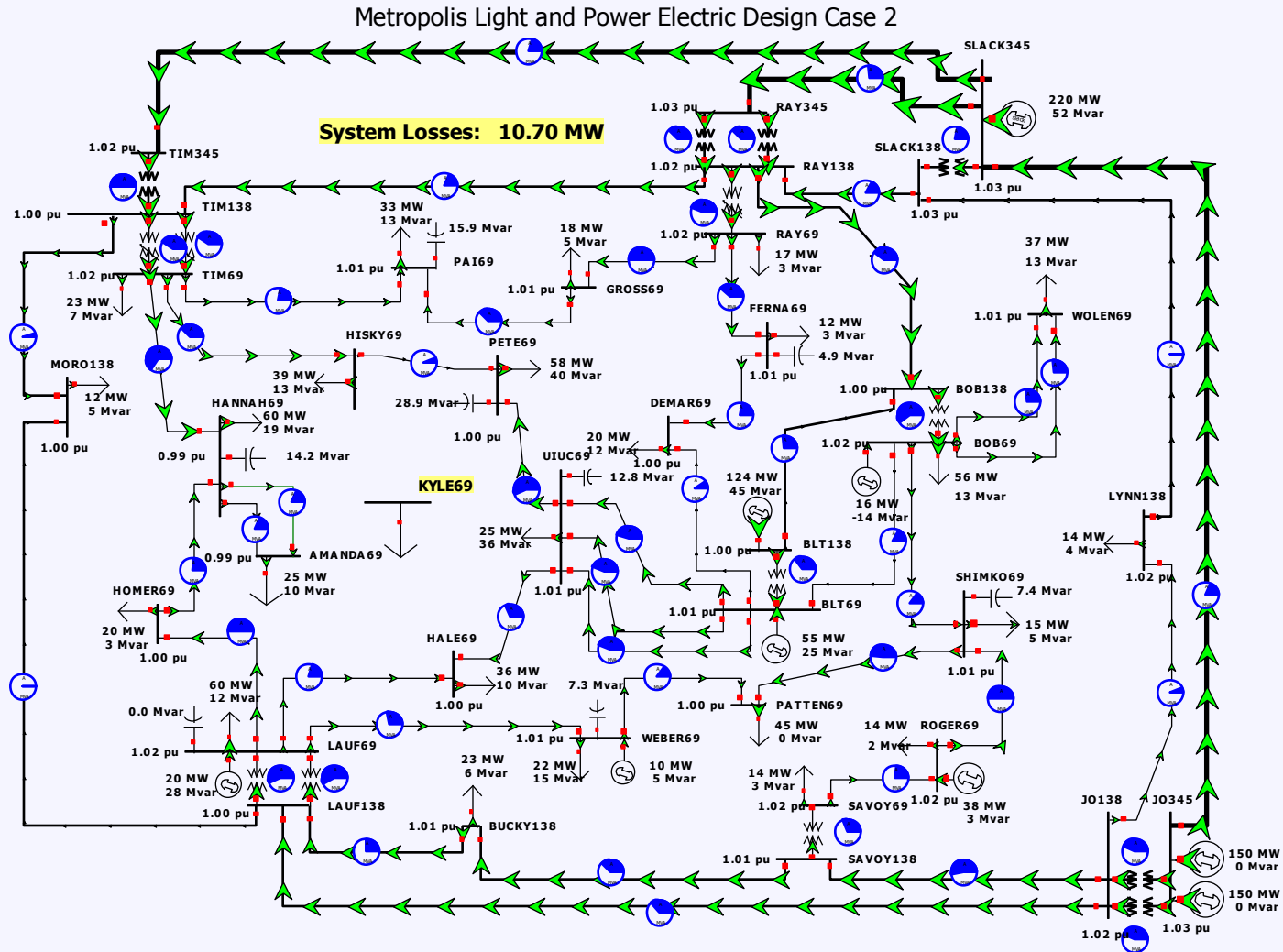


# Lecture 2

# 37 Bus Example Design Case



# Good Power System Operation

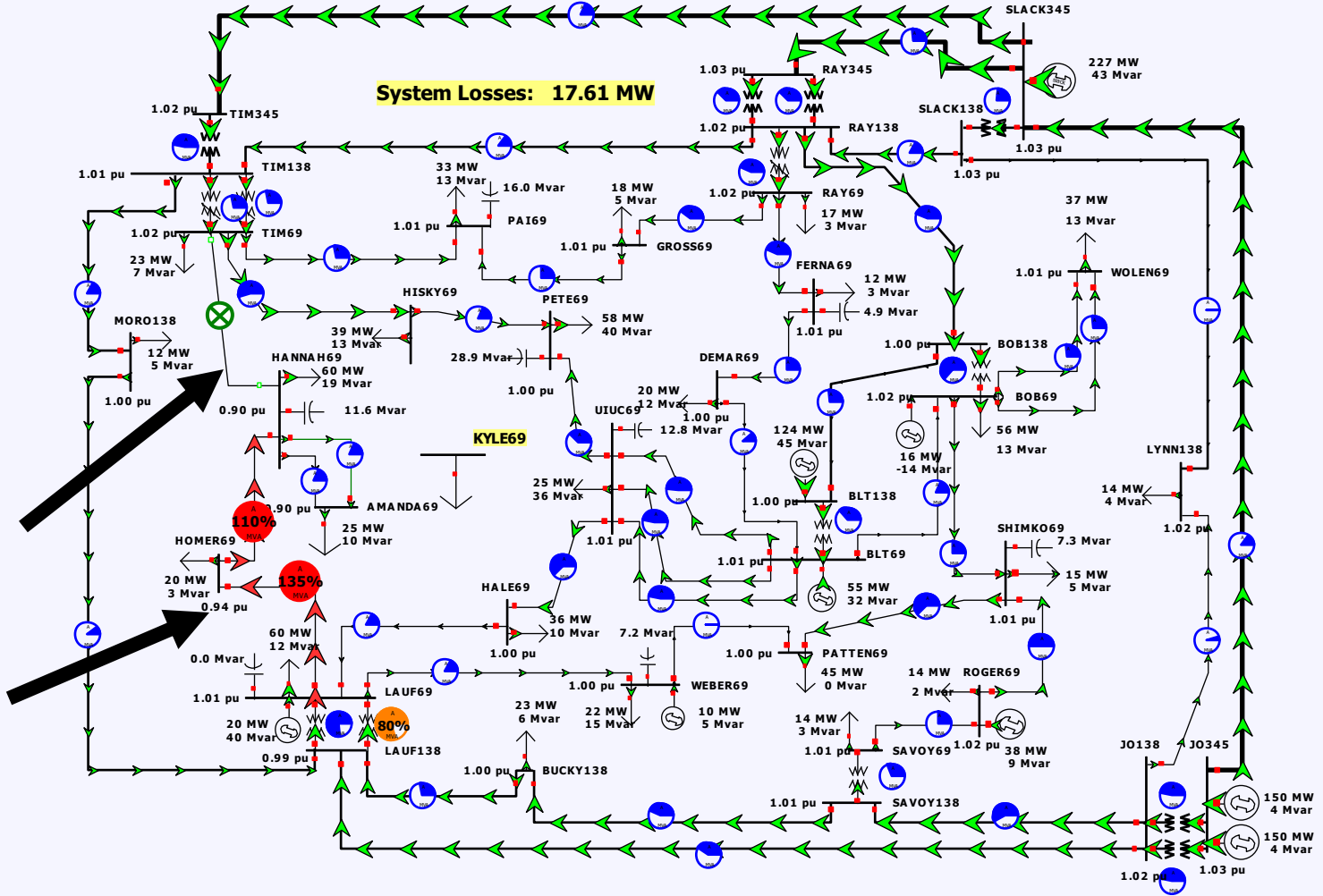
- Good power system operation requires that there be no “reliability” violations (needing to shed load, have cascading outages, or other unacceptable conditions) for either the current condition or in the event of statistically likely contingencies:
  - Reliability requires as a minimum that there be no transmission line/transformer limit violations and that bus voltages be within acceptable limits (perhaps 0.95 to 1.08)
  - Example contingencies are the loss of any single device. This is known as  $n-1$  reliability.

# Good Power System Operation

- North American Electric Reliability Corporation now has legal authority to enforce reliability standards (and there are now lots of them).
- See <http://www.nerc.com> for details (click on Standards)

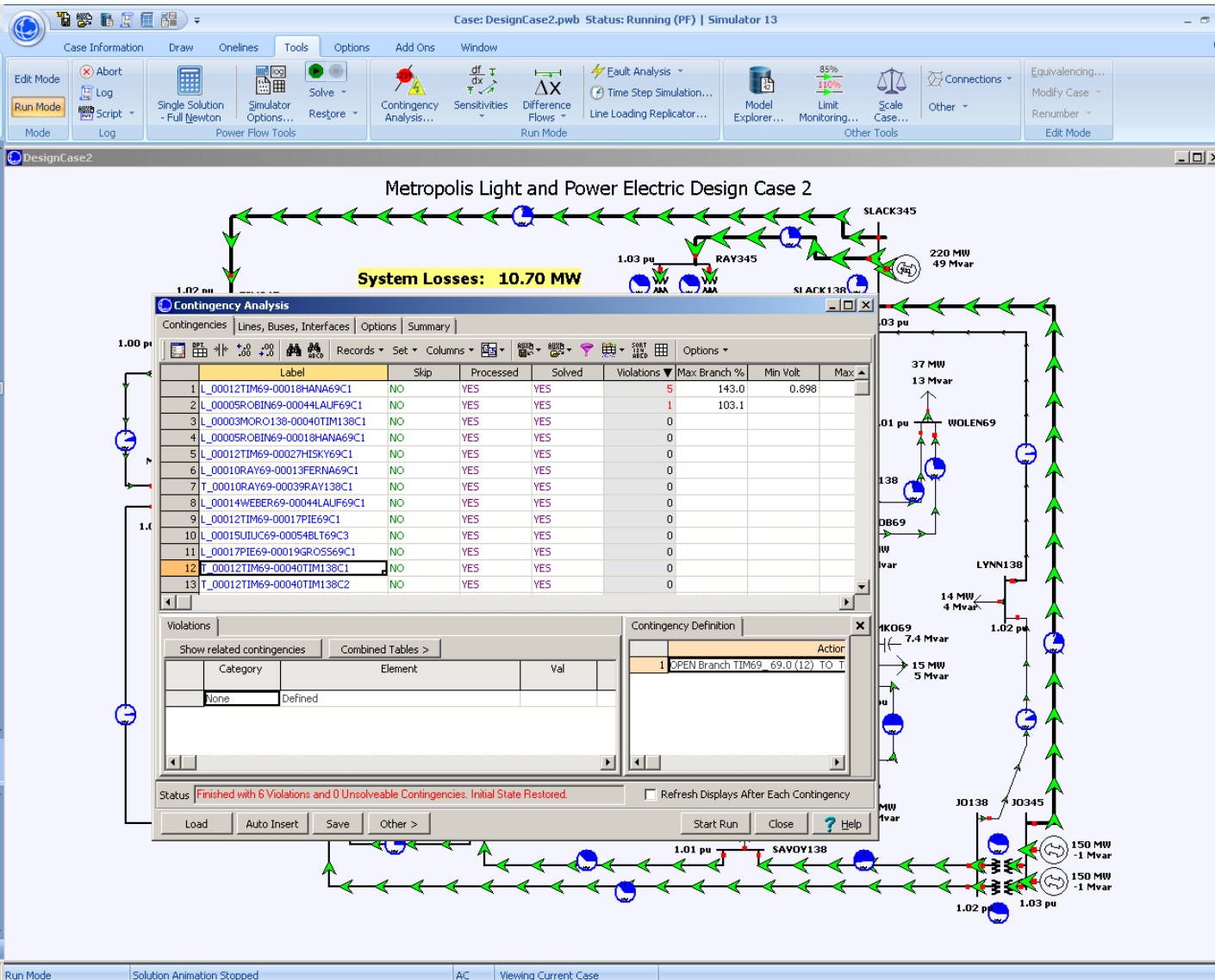
# Looking at the Impact of Line Outages

Metropolis Light and Power Electric Design Case 2



Opening one line (Tim69-Hannah69) causes overloads. This would not be Allowed.

# Contingency Analysis



Contingency analysis provides an automatic way of looking at all the statistically likely contingencies. In this example the contingency set is all the single line/transformer outages