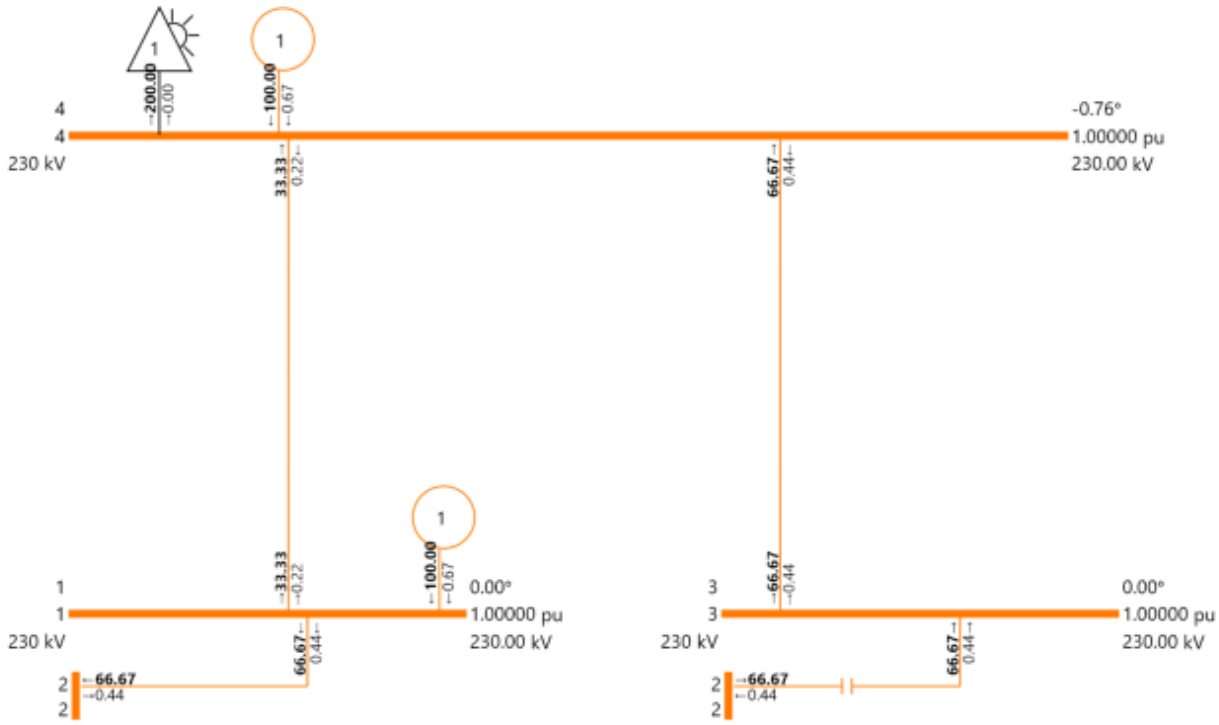
GE VERNOVA

THE ENERGY TO CHANGE THE WORLD

SCMOV model simulation results

- The characteristics and parameters of the scmov model in PSLF library are similar to those of the PowerWorld scmov model.
- The modes of operation and transitionings between these modes are also similar to those of PowerWorld model.
- The small test example from PowerWorld simulation with the same model parameters and simulation settings is used to validate the results of the simulations.



Events occurred during the simulation

GE VERNOVA

Time	Event
1.0	3-phase fault is applied on bus 3, mov started to conduct
2.0	Fault impedance decreased, causing fault currents to increase
2.1	Mov pickup timer expires, so a bypass event is scheduled with a delay of 1s
2.2	Capacitor pickup timer expires, so a bypass event is scheduled with a delay of 0.8s
3.0	Capacitor and mov are bypassed due to Icap exceeding Icaplim (after 0.8s delay)
4.0	Fault is cleared, the accumulated energy is 78.35 MJ, which is below the Energy limit
6.0	Tinsert timer is expired and the capacitor is reinserted
21.0	3-phase fault is applied on bus 3, mov started to conduct
22.0	Fault impedance decreased, causing fault currents to increase
22.35	The mov energy exceeds 135.7 MJ
23.0	Before the energy timer expires and permanently bypass the capacitor and mov, they are bypassed due to Icap exceeding Icaplim (after 0.8s delay)
24.0	Fault is cleared
26.0	Tinsert timer is expired and the capacitor is reinserted, but, since the mov energy is still above the energy limit, the energy timer starts, again.
27.0	Enerdly timer is expired and a permanent bypass happens.
35.0	Removing the permanent bypass by user
41.0	3-phase fault is applied on bus 3, mov started to conduct

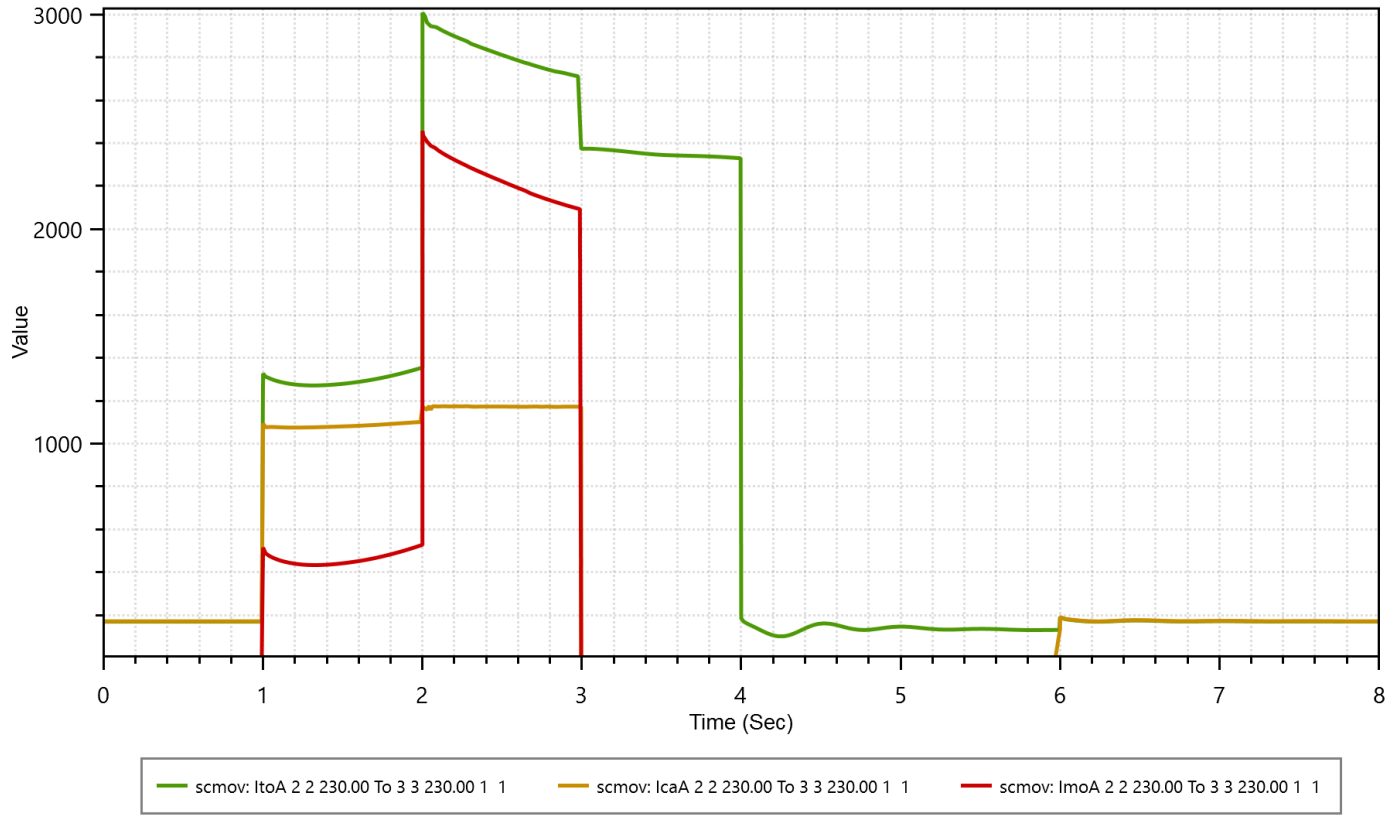
Events occurred during the simulation

GE VERNOVA

Time	Event
42.0	Fault impedance decreased, causing fault currents to increase
42.1	Mov pickup timer expires, so a bypass event is scheduled with a delay of 1s
42.2	Capacitor pickup timer expires, so a bypass event is scheduled with a delay of 0.8s
43.0	Capacitor and mov are bypassed due to Icap exceeding Icaplim (after 0.8s delay)
44.0	Fault is cleared
46.0	Tinsert timer is expired and the capacitor is reinserted
61.0	3-phase fault is applied on bus 3, mov started to conduct
62.0	Fault impedance decreased, causing fault currents to increase
62.1	Mov pickup timer expires, so a bypass event is scheduled with a delay of 1s
62.2	Capacitor pickup timer expires, so a bypass event is scheduled with a delay of 0.8s
63.0	Capacitor and mov are bypassed due to Icap exceeding Icaplim (after 0.8s delay)
64.0	Fault is cleared
66.0	Tinsert timer is expired and the capacitor is reinserted, but, since the mov energy is still above the energy limit, the energy timer starts, again.
67.0	Enerdly timer is expired and a permanent bypass happens.
80.0	End of simulation

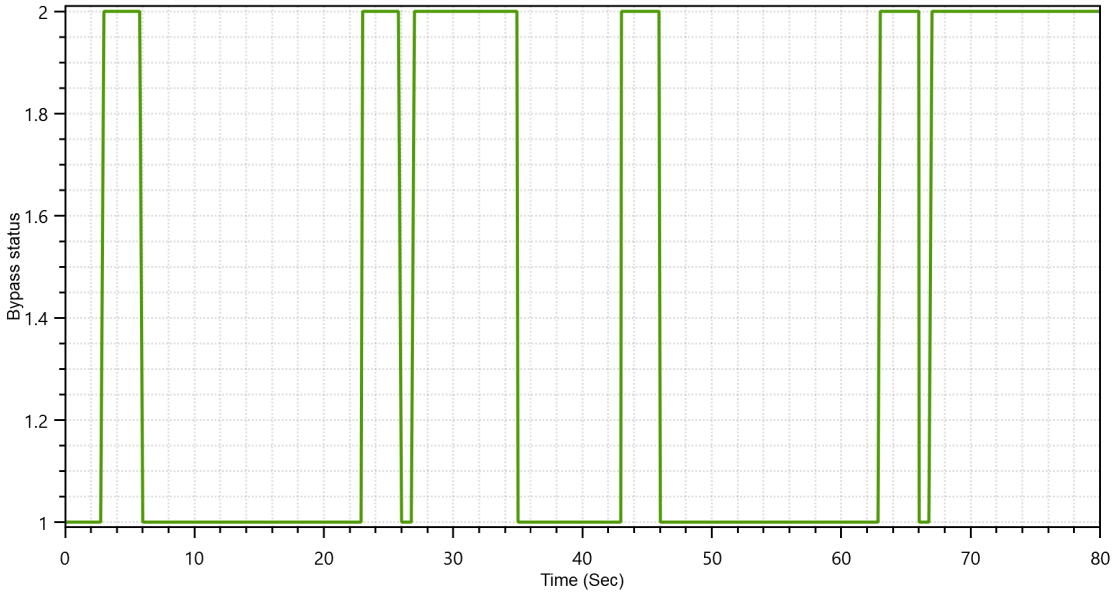
Simulation results

- The currents flowing through the series capacitor (IcaA), mov (ImoA), and the total current (ItoA) are shown this figure.
- The signals look similar to those shown in PowerWorld documentation.

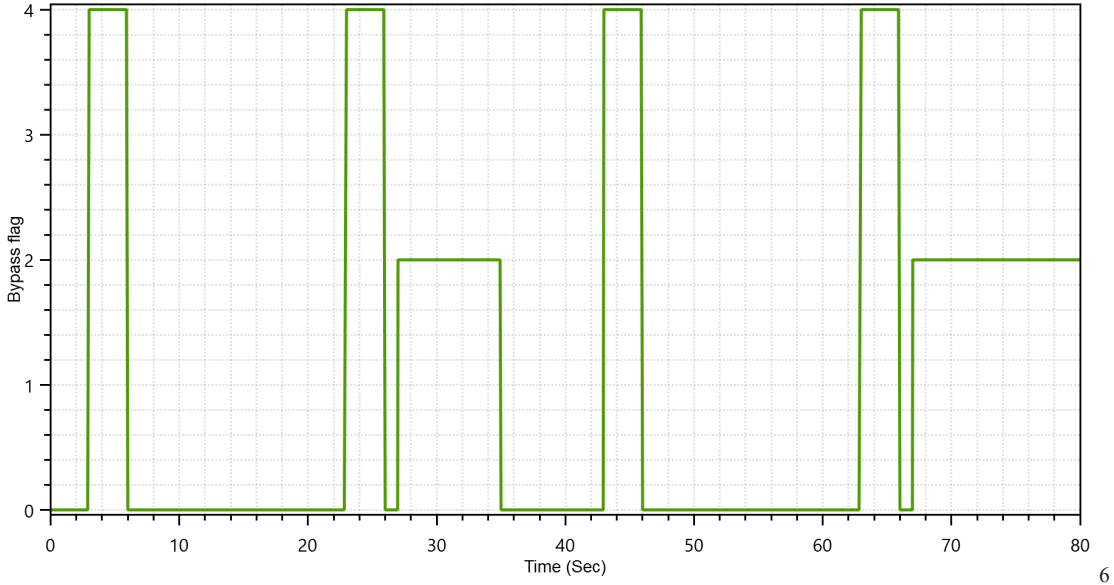


Simulation results

- Following figure shows the bypass status of the capacitor (**1 mean capacitor is in service and 2 means the capacitor is bypassed**).

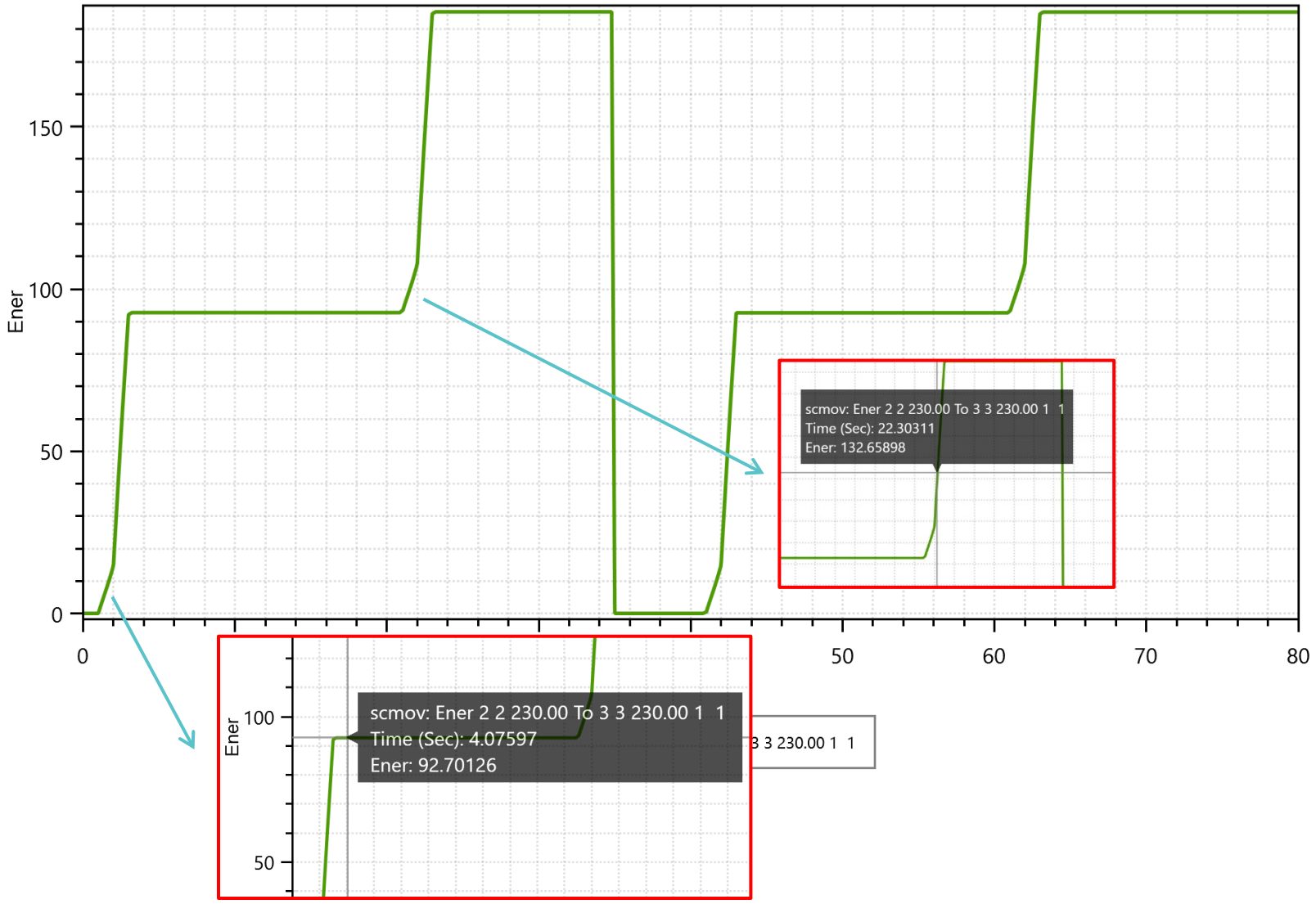


- Following figure shows the bypass flag of the capacitor (**4 means bypass due to violating capacitor current limit and 2 means bypass due to violating mov energy limit**).



Simulation results

- Following figure shows the Energy accumulated in the mov.
- The results match with the PowerWorld results.



GE VERNOVA

THANK YOU