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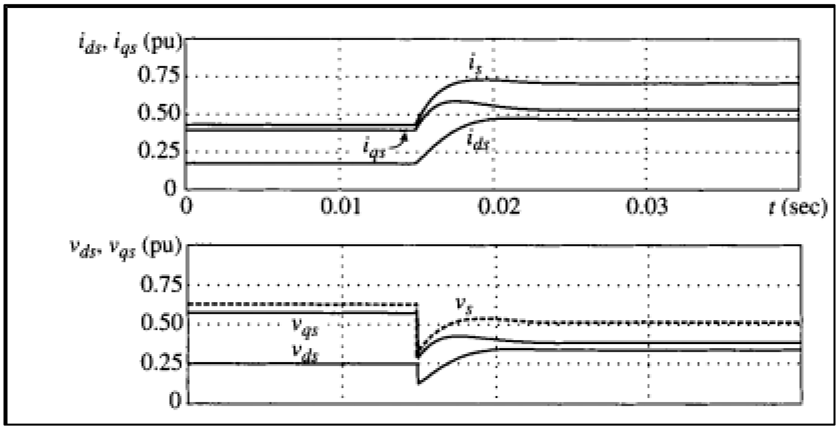
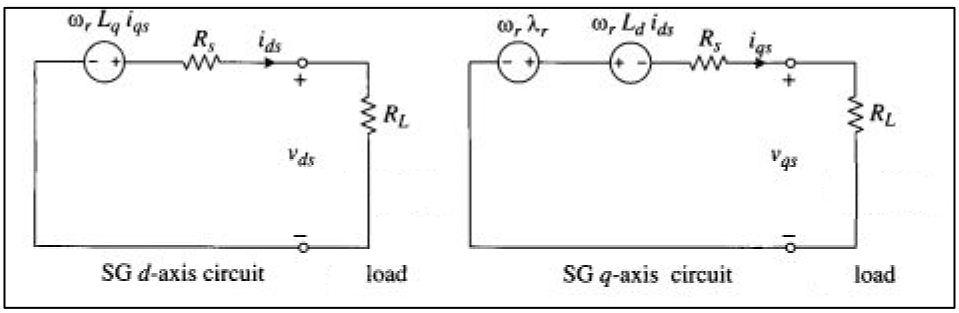


$$R_L = \frac{v_{ds}}{i_{ds}} = \frac{v_{qs}}{i_{qs}}$$



From the graphs of vds (initial value is estimated to be 0.25 p.u. and final value is almost 0.35 p.u.) and ids (initial value is estimated to be 0.16 p.u. and final value is almost 0.45 p.u.),

$$R_L = \frac{v_{ds,initial}}{i_{ds,initial}} = \frac{0.25}{0.16} = 1.56\, p.u.$$

$$\frac{R_L}{2} = \frac{v_{ds,final}}{i_{ds,final}} = \frac{0.35}{0.45} = 0.77\, p.u.$$

From the graphs of vqs (initial value is estimated to be 0.6 p.u. and final value is almost 0.4 p.u.) and iqs (initial value is estimated to be 0.4 p.u. and final value is almost 0.55 p.u.),

$$R_L = \frac{v_{qs,initial}}{i_{qs,initial}} = \frac{0.6}{0.4} = 1.5\, p.u.$$

$$\frac{R_L}{2} = \frac{v_{qs,final}}{i_{qs,final}} = \frac{0.4}{0.55} = 0.73\, p.u.$$

Hence R_L≈1.5 p.u. (6 Ohm)

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Steady-State Analysis of Stand-Alone SG with RL Load.

$$i_{qs} = \frac{\omega_r \lambda_r (R_L + R_s)}{(R_L + R_s)^2 + \omega_r^2 (L_L + L_d)(L_L + L_q)}$$

$$i_{ds} = \frac{\omega_r (L_L + L_q)}{R_L + R_s} i_{qs}$$

In this case

$L_L = 0$

```
iqs=((w*7.030056*(6+Rs))/((6+Rs)*(6+Rs)+w*w*Ld*Lq))= 262.7145
iqs_pu=iqs/(490*sqrt(2))= 0.3791 p.u.
ids=((w*Lq*iqs)/(Rs+6))= 114.7591
ids_pu=ids/(490*sqrt(2))=0.1656 p.u.
```