

$$\begin{aligned} \sigma_s &= 0.33 & K &= 1.2 \\ \zeta &= 0.3328 & T_s &= 30 \\ \omega_n &= 0.4007 \end{aligned}$$

$$\%OS = 1.576 - 1.2 = .376$$

$$\zeta = \frac{|\ln(\frac{\%OS}{100})|}{\sqrt{\pi^2 + \ln^2(\frac{\%OS}{100})}} = 0.297283168$$

$$\Delta T = 15.945 \text{ seg}$$

$$\omega_d = \frac{2\pi}{T} = \frac{2\pi}{15.945 \text{ seg}} = 0.3940536411$$

$$\omega_n = \frac{\omega_d}{\sqrt{1 - \zeta^2}} = \frac{0.394}{\sqrt{1 - 0.3328^2}} = 0.4127126447$$

$$G_p(s) = \frac{K\omega_n^2}{s^2 + 2\zeta\omega_n s + \omega_n^2}$$

$$= \frac{(1.2)(0.6656)^2}{s^2 + 2(0.3328)(0.6656)s + (0.6656)^2}$$

$$= \frac{0.5315756004}{s^2 + 0.4430015129s + 0.442979667}$$

$$\sigma_s = .706$$

$$\%OS = 70.6\%$$

$$\zeta = \frac{|\ln(\frac{\%OS}{100})|}{\sqrt{\pi^2 + \ln^2(\frac{\%OS}{100})}} =$$

$$T = (1.235 \times 10^4) - 2339 = 10,011 \text{ ms}$$

$$\omega_d = \frac{2\pi}{T} = \frac{2\pi}{10,011 \text{ ms}} = 0.62763$$

$$\omega_n = \frac{\omega_d}{\sqrt{1 - \zeta^2}} = \frac{0.62763}{\sqrt{1 - 0.3328^2}} = 0.6656$$

$$G_p(s) = \frac{K\omega_n^2}{s^2 + 2\zeta\omega_n s + \omega_n^2}$$

$$= \frac{(1.2)(0.6656)^2}{s^2 + 2(0.3328)(0.6656)s + (0.6656)^2}$$

$$= \frac{0.5315756004}{s^2 + 0.4430015129s + 0.442979667}$$

Teorico 3V