2.6 Establish Time the Launch Site Crosses the Orbital Plane (Continued)

Including their impact, gives

$$t_L = \frac{1}{\Omega_e}\left[\Omega - \Lambda_L + n\dot{\Omega}_w - \left(\frac{\theta_t}{360^\circ}\right)\dot{\Omega}_t - \left(\frac{\theta_f}{360^\circ}\right)\dot{\Omega}_f \pm \sin^{-1}\left(\frac{\tan L_L}{\tan i}\right) + \delta\, 180^\circ\right]$$

$$\delta = \begin{cases} 0, \text{ Launch North} \\ 1, \text{ Launch South} \end{cases}$$

$$\sin^{-1}\left(\frac{\tan L_L}{\tan i}\right) = \begin{cases} + \text{ North} \\ - \text{ South} \end{cases}$$

(2.6-3)

If small errors in the nodal position are accepted due to fuel available for maneuvering, then it is possible to launch at a time when the launch site is arbitrarily close to the desired plane. This launch time tolerance is given by

$$\Delta t_L = \Delta\Omega/\Omega_e$$

where $\Delta\Omega$ = allowable nodal error.