

EQUATIONS

$$\dot{Q} = \dot{m}c_p\Delta T$$

$$N = S/(1 - K_{\text{eff}})$$

$$\dot{Q} = \dot{m}\Delta h$$

$$CR_1(1 - K_{\text{eff}_1}) = CR_2(1 - K_{\text{eff}_2})$$

$$\dot{Q} = UA\Delta T$$

$$1/M = CR_1/CR_x$$

$$\dot{Q} \propto \dot{m}_{\text{Nat Circ}}^3$$

$$A = \pi r^2$$

$$\Delta T \propto \dot{m}_{\text{Nat Circ}}^2$$

$$F = PA$$

$$K_{\text{eff}} = 1/(1 - \rho)$$

$$\dot{m} = \rho A \bar{v}$$

$$\rho = (K_{\text{eff}} - 1)/K_{\text{eff}}$$

$$\dot{W}_{\text{Pump}} = \dot{m}\Delta P_v$$

$$\text{SUR} = 26.06/\tau$$

$$P = I^2 R$$

$$\tau = \frac{\bar{\beta}_{\text{eff}} - \rho}{\lambda_{\text{eff}} \rho}$$

$$P = IE$$

$$\rho = \frac{\ell^*}{\tau} + \frac{\bar{\beta}_{\text{eff}}}{1 + \lambda_{\text{eff}} \tau}$$

$$P_A = \sqrt{3}IE$$

$$P_T = \sqrt{3}IEpf$$

$$\ell^* = 1.0 \times 10^{-4} \text{ sec}$$

$$P_R = \sqrt{3}IE\sin\theta$$

$$\lambda_{\text{eff}} = 0.1 \text{ sec}^{-1} \text{ (for } \rho > 0)$$

$$\text{Thermal Efficiency} = \text{Net Work Out/Energy In}$$

$$\text{DRW} \propto \varphi_{\text{tip}}^2/\varphi_{\text{avg}}^2$$

$$\frac{g(z_2 - z_1)}{g_c} + \frac{(\bar{v}_2^2 - \bar{v}_1^2)}{2g_c} + v(P_2 - P_1) + (u_2 - u_1) + (q - w) = 0$$

$$P = P_0 e^{t/\tau}$$

$$g = 32.2 \text{ ft/sec}^2$$

$$P = P_0 10^{\text{SUR}(t)}$$

$$g_c = 32.2 \text{ lbf-ft/lbf-sec}^2$$

$$A = A_0 e^{-\lambda t}$$

CONVERSIONS

$$1 \text{ MW} = 3.41 \times 10^6 \text{ Btu/hr} \quad ^\circ\text{C} = (5/9)(^\circ\text{F} - 32)$$

$$1 \text{ ft}_{\text{water}}^3 = 7.48 \text{ gal}$$

$$1 \text{ hp} = 2.54 \times 10^3 \text{ Btu/hr} \quad ^\circ\text{F} = (9/5)(^\circ\text{C}) + 32$$

$$1 \text{ gal}_{\text{water}} = 8.35 \text{ lbf}$$

$$1 \text{ Btu} = 778 \text{ ft-lbf}$$

$$1 \text{ kg} = 2.21 \text{ lbf}$$

$$1 \text{ Curie} = 3.7 \times 10^{10} \text{ dps}$$

