$$\Delta m_1 = \Delta m_2$$
$$\Downarrow$$
$$\rho A_1 u_1 \Delta t = \rho A_2 u_2 \Delta t$$
$$\Downarrow$$
$$A_1 u_1 = A_2 u_2$$
$$1 <$$
$$A_2 \Rightarrow$$
$$u_1 >$$
$$u_2$$
$$A_1 >$$
$$A_2 \Rightarrow$$
$$u_1 <$$
$$u_2.$$

(1)
$$\Delta m_1 = \rho_{\text{air}} A_1 u_1 \Delta t$$

(2)
$$\Delta m_2 = \rho_{\text{air}} A_2 u_2 \Delta t$$

(3)
$$u_2 = \frac{A_1}{A_2} u_1$$

(4)
$$u_2 = \frac{65m \cdot \text{h}}{15m \cdot \text{h}} \cdot 10m/s = 43.3m/s$$

(5)
$$\pi R^2 u_1 = \pi r^2 u_2$$

$$\frac{2u_2^2 = \frac{m}{2} u_1^2 + mgh \Downarrow u_2^2 = u_1^2 + 2gh,}{g =}$$
$$9.82 m/S^2$$

$$R = \left(\frac{\pi r^2}{\pi R^2}\right)^{\frac{1}{2}} = \left(\frac{A_2}{A_1}\right)^{\frac{1}{2}} = \left(\frac{u_1}{u_2}\right)^{\frac{1}{2}} = \left(\frac{u_1^2}{u_2^2}\right)^{\frac{1}{4}} = \left(\frac{u_1^2}{u_1^2 + 2gh}\right)^{\frac{1}{4}}$$

$$h$$
$$A_1 \ll$$
$$A_0$$

(6)
$$h(t) = H \sin \omega t, \omega = 2\pi f = \frac{2\pi}{T},$$

$$f$$
$$T$$
$$\omega$$
$$_0(t) =$$
$$\frac{dh(t)}{dt}$$
$$= \overline{H} \omega \cos \omega t$$
$$_0 u_0(t) =$$
$$A_1 u_1(t)$$
$$\Downarrow$$
$$u_1(t) =$$
$$\frac{A_0}{A_1} u_0 \cos \omega t$$

(7)
$$A_1 \ll A_0 \Rightarrow u_1(t) \gg u_0(t)$$

(8)
$$r = R + kx.$$

(9)
$$\left. \frac{\Delta m}{\Delta t} \right|_{x=0^+} = \rho \pi R^2 v(0^+) + \rho \pi (r^2 - R^2) u = \rho \pi r^2 v(x) = \left. \frac{\Delta m}{\Delta t} \right|_x .$$

$$2$$
$$r^2 v(0^+) + \frac{r^2 - R^2}{r^2} u = u - \frac{R^2}{r^2}(u - v(0^+)) = u \left\{ 1 - \frac{1 - \frac{v(0^+)}{u}}{\left(1 + \frac{kx}{R}\right)^2} \right\}.$$

(10)
$$q = \frac{v(0^+)}{u}$$

$$\lim_{x \to 0_+} v(x) =$$
$$v(0^+)$$
$$\lim_{x \to \infty} v(x) =$$
$$u$$
$$\text{extracted} =$$
$$\frac{m}{2}\left(u^2 - v^2(0^+)\right)$$
$$\frac{1}{2}\rho \pi R^2 \frac{u + v(0^+)}{2} \Delta t (u^2 - v^2(0^+))$$
$$\frac{dE_{\text{extracted}}^{\text{turbine}}}{dt} =$$