At what downstream position are gust speeds $= U_s + 3u$?

$F_{jet} = 50{,}000\ N = \rho U_j^2 A$ $\quad \rho_{air} = 1.25\ kg/m^3$.

$U_j = 225\ m/s$

from 4.4.15 $\rightarrow$ $\dfrac{U_s}{U_j} = 6.4\dfrac{d}{x}$; $\quad l = 0.067x$

jet condition $\dfrac{u^2}{U_s^2} \simeq \dfrac{l}{x}$

Gust speed $= U_s + 3u$.

$$= 6.4\frac{d}{x}U_j + 3U_s\sqrt{\frac{l}{x}}$$

$$= 6.4\frac{d}{x}U_j + 3 \cdot 6.4 U_j \frac{d}{x}\cdot\sqrt{\frac{l}{x}}$$

$$= 6.4\frac{d}{x}U_j\left(1 + 3\sqrt{.067}\right)$$

$$= 1.77\,(6.4)\frac{d}{x}U_j$$

~~when~~ At for gust speed $= 10$, $\quad x \triangleq 250\ m$.