55. **SSM** ***REASONING AND SOLUTION*** From the results of Example 13, the self-inductance L of a long solenoid is given by $L = \mu_0 n^2 A\ell$. Solving for the number of turns n per unit length gives

$$n = \sqrt{\frac{L}{\mu_0 A\ell}} = \sqrt{\frac{1.4 \times 10^{-3}\ \text{H}}{(4\pi \times 10^{-7}\ \text{T} \cdot \text{m/A})(1.2 \times 10^{-3}\ \text{m}^2)(0.052\ \text{m})}} = 4.2 \times 10^3\ \text{turns/m}$$

Therefore, the total number of turns N is the product of n and the length ℓ of the solenoid:

$$N = n\ell = (4.2 \times 10^3\ \text{turns/m})(0.052\ \text{m}) = \boxed{220\ \text{turns}}$$