Let $N$ denote the number of accidents, which is binomial with parameters $\frac{1}{4}$ and 3 and thus has mean $3 \left( \frac{1}{4} \right) = \frac{3}{4}$ and variance $3 \left( \frac{1}{4} \right) \left( \frac{3}{4} \right) = \frac{9}{16}$.

Let $X_i$ denote the unreimbursed loss due to the $i^{th}$ accident, which is 0.3 times an exponentially distributed random variable with mean 0.8 and therefore variance $(0.8)^2 = 0.64$. Thus, $X_i$ has mean $0.8(0.3) = 0.24$ and variance $0.64(0.3)^2 = 0.0576$.

Let $X$ denote the total unreimbursed loss due to the $N$ accidents.

This problem can be solved using the conditional variance formula. Note that independence is used to write the variance of a sum as the sum of the variances.

$$\text{Var}(X) = \text{Var}[E(X \mid N)] + E[\text{Var}(X \mid N)]$$
$$= \text{Var}[E(X_1 + \ldots + X_N)] + E[\text{Var}(X_1 + \ldots + X_N)]$$
$$= \text{Var}(N\mathbb{E}(X_1)) + E[N\text{Var}(X_1)]$$
$$= \text{Var}(0.24N) + E(0.0576N)$$
$$= (0.24)^2 \text{Var}(N) + 0.0576\mathbb{E}(N)$$
$$= 0.0576 \left( \frac{9}{16} \right) + 0.0576 \left( \frac{3}{4} \right) = 0.0756.$$