For PRSU awards granted in 2018, only a prorated number of shares may vest at the end of the performance period based upon achievement of the performance target, with the proration based upon the number of months of continuous employment during the three-year performance period. Employees with a “Long Service Separation” must also fulfill a six-month requisite service period in order to be eligible for the prorated vesting of outstanding PRSU awards granted in 2018. We recognize compensation expense for the 2018 PRSU grant on a straight-line basis over the three-year performance period for all participants. Award terms for the 2020 and 2019 PRSU grants allowed for continued vesting upon achievement of the performance target specified in the award document for employees who meet the criteria for a “Long Service Separation” and fulfill a requisite service period of six months. We recognize compensation expense for the 2020 and 2019 PRSU grants with respect to employees who have met the criteria for a “Long Service Separation” over the period from the grant date to the end of the six-month requisite service period. For employees who become eligible for a “Long Service Separation” subsequent to the end date of the six-month requisite service period and prior to the completion of the vesting period, we recognize compensation expense over the period from the grant date to the date eligibility is achieved.

At grant, option awards have a term life of ten years. For awards granted prior to 2016, if the “Long Service Separation” criteria are met, the vested options have a life that is the lesser of ten years from the original grant date or five years from the separation date. For awards granted beginning in 2016, the vested options have a life equal to ten years from the original grant date.

Accounting guidance on share-based payments requires companies to estimate the fair value of options on the date of grant using an option-pricing model. The fair value of our option grants was estimated using the Black-Scholes option-pricing model. The Black-Scholes option-pricing model considers a range of assumptions related to volatility, risk-free interest rate and historical employee behavior. Expected volatility was based on historical Caterpillar stock price movement and current implied volatilities from traded options on Caterpillar stock. The risk-free interest rate was based on U.S. Treasury security yields at the time of grant. The weighted-average dividend yield was based on historical information. We determine the expected life from the actual historical employee exercise behavior. The following table provides the assumptions used in determining the fair value of the Option awards for the years ended December 31, 2020, 2019 and 2018, respectively.

| | **Grant Year** | | |
|---|---|---|---|
| | **2020** | 2019 | 2018 |
| Weighted-average dividend yield | **2.5 %** | 2.6 % | 2.7 % |
| Weighted-average volatility | **25.7 %** | 29.1 % | 30.2 % |
| Range of volatilities | **24.5%-29.7%** | 25.1%-38.7% | 21.5%- 33.0% |
| Range of risk-free interest rates | **1.21%-1.39%** | 2.48%-2.68% | 2.02%-2.87% |
| Weighted-average expected lives | **8 years** | 7 years | 8 years |

Beginning with the 2018 grant, we credit RSU and PRSU awards with dividend equivalent units on each date that we pay a cash dividend to holders of Common stock. We determine the fair value of the RSU and PRSU awards granted in 2020, 2019 and 2018 as the closing stock price on the date of the grant.