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STAFF QUESTIONS AND ANSWERS

AUDITING THE FAIR VALUE OF SHARE OPTIONS GRANTED TO EMPLOYEES

October 17, 2006

Summary: Staff questions and answers set forth the staff's opinions on issues related to the implementation of the standards of the Public Company Accounting Oversight Board ("PCAOB" or "Board"). The staff publishes questions and answers to help auditors implement, and the Board's staff administer, the Board's standards. The statements contained in the staff questions and answers are not rules of the Board, nor have they been approved by the Board.

The following staff questions and answers are applicable to audits of financial statements in circumstances in which a company has granted share options to employees that must be accounted for as compensation cost in conformity with Statement of Financial Accounting Standards No. 123 (revised 2004), *Share-Based Payment*, issued by the Financial Accounting Standards Board. These staff questions and answers were prepared by the Office of the Chief Auditor. Additional questions should be directed to Greg Fletcher, Assistant Chief Auditor (202/207-9203; fletcherg@pcaobus.org) or Jennifer Rand, Deputy Chief Auditor (202/207-9206; randj@pcaobus.org).

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General

Q1. What is the purpose of these PCAOB staff questions and answers about auditing the fair value of employee share options?

> **A1.** The purpose of these questions and answers is to help auditors implement the PCAOB's existing auditing standards when auditing the fair value of share options granted to employees. The Financial Accounting Standards Board ("FASB") issued Statement of Financial Accounting Standards No. 123, *Share-*

Based Payment (revised 2004) ("FAS 123R"), which established the accounting requirements for companies that grant share options to employees and generally required that companies recognize as compensation cost the grant-date fair value of the award. In addition, the SEC staff issued Staff Accounting Bulletin 107 ("SAB 107") in March 2005, which, among other things, provides the Securities and Exchange Commission ("SEC") staff's views regarding the valuation of share-based payment arrangements for public companies. Based on these developments, the PCAOB staff believes that there is a need for guidance for implementing the existing auditing standards related to a company's accounting for the fair value of employee share options.[1/]

Q2. Which auditing standards of the PCAOB provide direction on auditing the fair value of employee share options and what are the general steps involved in auditing them?

A2. Because employee share options are complex financial instruments with no available market, companies generally use option-pricing models to estimate the fair value. As such, these valuations are accounting estimates, and AU sec. 342, *Auditing Accounting Estimates*, and AU sec. 328, *Auditing Fair Value Measurements*, most directly apply. In addition, because fraudulent financial reporting often is accomplished through an intentional misstatement of an estimate, AU sec. 316, *Consideration of Fraud in a Financial Statement Audit*, also applies.[2/]

1/ This series of PCAOB staff questions and answers addresses the principles and procedures related to auditing the grant-date fair value of employee share options, which is a component of compensation cost associated with the issuance of employee share options. It does not address auditing the other components of determining and reporting compensation cost in the financial statements. Other components include making adjustments for actual pre-vesting forfeitures to arrive at the compensation cost related to the share option grant; determining the periods in which compensation cost is recognized in the financial statements; determining related financial statement effects of employee share options to the company, such as income tax effects; and making the appropriate entries in the general ledger.

2/ The Board adopted as its interim standards generally accepted auditing standards as described in the AICPA Auditing Standards Board's Statement on Auditing

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In general, when auditing the fair value of employee share options, the auditor should:

- Obtain an understanding of the process used to develop the estimated fair value of employee share options;

- Assess the risk of misstatement related to the fair value of employee share options; and

- Perform testing on the company's estimated value of employee share options. Testing includes:

  - Evaluating the consistency of the process,

  - Evaluating the reasonableness of (1) the company's model and (2) the assumptions used in the model, such as expected term and expected volatility, and

  - Verifying the accuracy and completeness of the data underlying the fair value measurements.

The auditor also should evaluate whether he or she possesses the necessary skills and knowledge to plan and perform the audit procedures.

Each of these matters is addressed in the following PCAOB staff questions and answers.

<u>The Company's Process</u>

Q3. How should the auditor evaluate the company's process for estimating the fair value of employee share option grants?

A3. AU sec. 328.09 requires the auditor to obtain an understanding of the company's process for determining fair value measurements and disclosures and

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Standards No. 95, *Generally Accepted Auditing Standards*, as in existence on April 16, 2003, to the extent not superseded or amended by the Board, on an initial transitional basis.

of the relevant controls sufficient to develop an effective audit approach.[3/] AU sec. 328.23 states that, based on the auditor's assessment of the risk of material misstatement, the auditor should test the entity's fair value measurements and disclosures. AU sec. 328.23 also identifies three ways in which the auditor may test fair value measurements:

- Testing management's significant assumptions, the valuation model, and the underlying data,

- Developing independent fair value estimates for corroborative purposes, or

- Reviewing subsequent events and transactions.[4/]

Because of the complexity involved in developing an independent estimate and the limited usefulness of reviewing subsequent events and transactions to evaluate the fair value of employee share options, in many cases, the second and third approaches are not likely to be practical approaches to auditing the fair value of employee share options. In such cases, the auditor should test management's significant assumptions, the valuation model, and the underlying data related to the fair value estimate.

In applying the provisions of AU sec. 328 to the evaluation of the company's process for estimating the fair value of employee share option grants, the auditor should review the procedures used by the company to make the estimates. These procedures include:

[3/] Paragraph .12 of AU sec. 328, *Auditing Fair Value Measurements and Disclosures*, also provides items that auditors should consider when obtaining an understanding of fair value measurements and disclosures.

[4/] Similarly, in evaluating the reasonableness of an estimate, paragraph .10 of AU sec. 342, *Auditing Accounting Estimates*, requires the auditor to review and test the process used by management to develop an estimate, develop an independent estimate to corroborate the reasonableness of the company's estimate, or review subsequent events or transactions occurring before the completion of fieldwork.

- Evaluating how the terms of the share option awards affect the determination of the grant date, selection of model, and the assumptions used;[5/]

- Selecting the option-pricing model;[6/] (See also PCAOB staff question Nos. 5 and 6.)

- Developing the assumptions used in the valuation, including implementation of the guidance in FAS 123R and SAB 107,[7/] that could affect the assumptions;[8/] (See also PCAOB staff question Nos. 7-18.)

- Ensuring that the data upon which the fair value measurements are based (including employee exercises and post-vesting cancellations and lapses) are accurate and complete;[9/] (See also PCAOB staff question No. 19.) and

- Generating the estimated fair value of the employee share options, including executing the calculations required in the option-pricing model.[10/] (See also PCAOB staff question No. 20.)

The auditor also should evaluate whether the process is complete, including whether the company considers the relevant factors identified in the accounting

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5/ See Statement of Financial Accounting Standard No. 123, *Share-Based Payment* (revised 2004) ("FAS 123R"), paragraph A2.

6/ See FAS 123R, paragraphs A13 - A15.

7/ See SEC Staff Accounting Bulletin 107, Share-*Based Payment* (March 29, 2005).

8/ See FAS 123R, paragraph A16.

9/ See AU sec. 328.39

10/ Ibid.

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literature that affect the assumptions and whether the company applies the process consistently from period to period.[11/]

In addition, in auditing the financial statements, the auditor may determine that it is not practical or possible to restrict detection risk to an acceptable level by performing only substantive tests for one or more assertions. In such circumstances, the auditor should obtain evidence about the effectiveness of both the design and operation of controls to reduce the assessed level of control risk.[12/, 13/]

Risk Factors

Q4. What factors affect the auditor's assessment of risk at the financial statement and significant account levels for fair value measurements related to employee share options?

A4. Accounts consisting of amounts derived from accounting estimates have a higher inherent risk than do accounts consisting of relatively routine factual data[14/] or having readily determinable values. Therefore, compensation cost based on fair value measurements of employee share options, and related disclosures, often will have a high inherent risk. The auditor should be aware of how changes in assumptions and models affect fair value.

11/ AU sec. 328.19 states that the auditor should evaluate whether the company's method (in this case, the company's process) for determining fair value measurements is applied consistently and if so, whether the consistency is appropriate considering possible changes in the environment or circumstances affecting the company, or changes in accounting principles.

12/ See AU sec. 319.03.

13/ In an integrated audit of the financial statements and internal control over financial reporting, the auditor must obtain evidence about the effectiveness of internal controls. This series of PCAOB staff questions and answers does not illustrate how the auditor should test the design and operating effectiveness of controls related to employee share option compensation cost and disclosures in an integrated audit.

14/ See AU sec. 312.27a.

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The following are examples of circumstances or conditions that indicate increased risk and might indicate a risk of fraud that would require a specific response from the auditor:[15/]

- When an assumption that a company uses has the effect of reducing the fair value below what it would have been had the company based the assumption on unadjusted historical information.
- Exclusion of an historical period of time from the inputs to the valuation model, especially when the effect of that exclusion is to lower expected term or expected volatility.[16/] (See also PCAOB staff question No. 14.)
- Adjustments to historical exercise behavior or historical share price volatility. For example:
  - The expected term estimate for the current grant of share options is five years when the company has averaged seven years in previous grants of share options;
  - The expected term or expected volatility estimate selected as the most likely was the lowest in a range of possible expected terms or expected volatilities; or
  - The expected term and expected volatility estimates are both lower than the historical averages.
- Adjustments to historical exercise behavior or historical share price volatility are not applied consistently to each option grant in circumstances in which they should have been consistently applied.

15/ See AU sec. 316.48b.

16/ See also SAB 107, interpretive response to question 2, Section D.1. SAB 107 states that valid exclusions of periods would be rare.

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Model Selection

Q5. Observable market prices generally are not available for employee share options because employee share options are not traded. As a result, companies ordinarily will need to use an option-pricing model to estimate the fair value of employee share options. What factors should the auditor use to evaluate the reasonableness of a company's selection of an option-pricing model for calculating the fair value of employee share options?[17/]

A5. The auditor should evaluate whether the model selected by the company:

- Is applied in a manner consistent with FAS 123R's fair value measurement objective;
- Is based on established principles of financial economic theory; and
- Reflects all of the substantive characteristics of the share options granted to employees.[18/]

The Black-Scholes-Merton formula, a closed-form option-pricing model, was developed for exchange-traded share options. As developed, it assumes that option exercises occur at the end of an option's contractual term, and that the other factors, expected volatility, expected dividends, and risk-free interest rates, are constant over the option's term. Because employees often exercise before the contractual term expires, FAS 123R requires companies to modify the term used as an input to the original formula by estimating an expected term for the employee share options that is less than the contractual term.

17/ See FAS 123R, paragraph A2. The fair value of equity instrument share options granted to employees is measured on the date of the grant.

18/ See FAS 123R, paragraph A8, AU sec. 328.18, and AU sec. 328.26b. In addition to the Black-Scholes-Merton formula and a lattice option-pricing model, a Monte Carlo simulation technique also satisfies the requirements in paragraph A8 of FAS 123R. See FAS 123R, footnote 48.

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A lattice, or binomial, option-pricing model, however, can accommodate dynamic assumptions of expected volatility and dividends over the option's contractual term, and estimates of expected option exercise patterns during the contractual term (for example, the likelihood that an employee will exercise when the share price reaches a certain multiple of the exercise price). Therefore, the design of a lattice model might more fully reflect the substantive characteristics of a particular employee share option.[19/]

The auditor should be alert to circumstances in which the selection of the Black-Scholes-Merton formula might not be appropriate. For example, the appropriate model for estimating the fair value of an instrument with a market condition (such as an exercise condition that is satisfied when the share price exceeds a specified value for a specified period of days) must take into account the effect of that market condition.[20/] The Black-Scholes-Merton option-pricing formula would not generally be an appropriate valuation model for a share option in which the exercisability is conditional on a specified increase in the price of the underlying shares because it is not designed to take into account that type of market condition.[21/]

Q6. What steps should the auditor take when a company changes the valuation technique or model chosen to value employee share options?

A6. The auditor should evaluate whether the new technique or model meets the fair value measurement objective of FAS 123R. The SEC staff has stated that it would not object to a company changing its valuation technique or model, as long as the new technique or model meets the fair value measurement objective.[22/] SAB 107 states that a company should take into account the reason for the change in technique or model in determining whether it meets the fair

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19/ See FAS 123R, paragraph A15.

20/ See FAS 123R, paragraph A14.

21/ See the interpretive response to question 2, section C of SAB 107.

22/ See the interpretive response to question 3, section C of SAB 107.

value measurement objective.[23/] However, the SEC staff also has stated that it would not expect that a company would frequently switch between valuation techniques or models, particularly when there has been no significant variation in the form of share-based payments being valued.[24/] As noted in SAB 107, changing a technique or model from period to period for the sole purpose of lowering the fair value estimate of a share option would not meet the fair value measurement objective of FAS 123R.[25/] Finally, frequent changes in the valuation technique or model also might indicate a risk of fraud that would require a response by the auditor. Accordingly, the auditor should evaluate management's reason for the change.

Assumptions Used In Option-pricing Models

Q7. Paragraph A18 of FAS 123R states that the valuation technique or model used to estimate the fair value of the share option shall take into account, at a minimum—

- Expected term of the option (in a lattice model, expected term is an output of the model);
- Expected volatility of the price of the underlying share for the expected term of the option;
- Exercise price of the option;
- Current price of the underlying share;
- Risk-free interest rate(s) for the expected term of the option; and
- Expected dividends of the underlying share for the expected term of the option.

[23/] Ibid.

[24/] Ibid.

[25/] Ibid.

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How should the auditor assess the possible effect of these six items on the fair value measurement?

> **A7.** The expected term and expected volatility assumptions have the highest risk because they involve the greatest amounts of judgment and have a significant effect on the estimated fair value. PCAOB staff question Nos. 8 through 11 provide direction to the auditor regarding expected term. PCAOB staff question Nos. 12 through 17 provide direction to the auditor regarding volatility.
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> The exercise price of the option and current price of the underlying shares have a significant effect on the fair value measurement and have a high degree of verifiability. The auditor should verify that the company has properly authorized the share option plan and test whether the company has properly authorized the specific terms of the award, correctly determined the grant date, and accurately entered the exercise price and current share price, as of the measurement date, into the valuation model.
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> The risk-free interest rate(s) might have an elevated risk because a mathematical computation could be involved. The expected dividends assumption might have an elevated risk because of potential measurer bias. PCAOB staff question No. 18 provides direction to the auditor regarding risk-free interest rate(s) and expected dividends.

Expected term of the option

Q8. The expected term assumption is one of the key drivers of fair value in the Black-Scholes-Merton formula.[26/] Paragraph A23 of FAS 123R states that assumptions used to estimate the fair value of share options granted to employees should be determined in a consistent manner from period to period. How should the auditor evaluate the reasonableness of the expected term assumption?

[26/] Expected term usually is an output of lattice models.

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A8. When a company is using the Black-Scholes-Merton option-pricing formula, the auditor should apply the following procedures to the expected term assumption:[27/]

- Obtain an understanding of the company's process for estimating expected term, including the extent to which the company evaluates relevant factors in the accounting literature;[28/]

- Verify that the expected term generally is at least equal to the vesting period of the share option grant;[29/]

- Verify that the company (1) has taken into account the contractual term of the option and the effects of employees' post-vesting employment termination behavior, in addition to employees' expected exercise behavior, and (2) has not taken into account pre-vesting employee termination behavior;[30/]

- Evaluate whether adjustments that the company has made to the historical exercise behavior are reasonable and supportable,[31/] including adjustments to the historical exercise behavior of groups (See also PCAOB staff question No. 11); and

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[27/] See PCAOB staff question No. 10 for a discussion about the "simplified method." If a company's share option plan has the characteristics that are sometimes referred to as "plain vanilla," it may use the simplified method for estimating expected term, as found in SAB 107. However, the SEC staff has stated that it does not expect the simplified method to be used for share option grants after December 31, 2007.

[28/] For example, see FAS 123R, paragraphs A26-A30.

[29/] See FAS 123R, paragraph 42. Some awards have graded vesting schedules. These may be accounted for as in-substance multiple awards.

[30/] Paragraphs A27 and A28 of FAS 123R describe factors that may affect expectations about employees' exercise behavior.

[31/] See FAS 123R, footnote 50.

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- Test the data that the company uses for its estimate, such as data on actual exercise behavior (See also PCAOB staff question No. 19).

The auditor also should evaluate whether the person or persons determining the expected term assumption, including the company's specialists, have experience in valuing employee share options,[32/] and assess how that evaluation affects the audit procedures.

Q9. What should the auditor do to test a company's calculation of its historical exercise experience for employee share options, including consideration of the contractual term and post-vesting employee behavior?

A9. Paragraph A21 of FAS 123R states that historical experience generally is the starting point for developing expectations about the future. Because the expected term estimate is the period of time for which the option is expected to be outstanding (that is, generally the period of time from the grant date to the date of expected exercise or other expected settlement), companies may start by calculating a historical weighted average period of time for which previous grants of share options were outstanding.

The auditor should verify that a company's calculations include options that were not exercised during the contractual term. Failure to include such options could significantly understate average time that options were outstanding. For example, if a company calculates historical exercise behavior based only on the 70 percent of the options exercised over a 10 year contractual term, then it will probably significantly understate the average by not considering the 30 percent of options that may have been outstanding for 10 years and never exercised.

The auditor should:

- Evaluate whether the company's calculations are complete; i.e., that the calculations include all vested options, including those that were never exercised;

32/ See AU sec. 328.12.

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- Evaluate whether the company's calculations are mathematically correct, including any separate calculations for groups of employees (See also PCAOB staff question No. 11); and

- Test the underlying data upon which the company's calculations are based, for example, the grant date and exercise date (See also PCAOB staff question No. 19).

The auditor also should be aware of situations in which historical information is not sufficiently complete to enable a company to use it as the sole basis for estimating expected term. For example, if a company issues employee share options for the first time in 20X4 with a three-year vesting period and a ten-year contractual term, it cannot use its unadjusted historical experience in estimating the expected term of additional grants in 20X8 because there will have been only one year in which the earlier grants could have been exercised. The earliest it will have a complete history is at the end of the ten-year contractual term.

In situations in which the company calculated the historical exercise behavior based on incomplete historical information, the auditor should evaluate whether the company's rationale for using this calculation in connection with an estimate of expected term is reasonable and supportable.

Q10. FAS 123R states that expectations based on historical experience should be modified to reflect ways in which currently available information indicates that the future is reasonably expected to differ from the past.[33/] What procedures should the auditor perform to evaluate the reasonableness of adjustments to historical exercise behavior?

A10. The auditor should evaluate whether the company's rationale for adjustments to historical exercise behavior are reasonable and supportable.[34/] The auditor also should evaluate whether the company failed to make a necessary adjustment. For example, if the historical experience is based on grants with one-year vesting, an adjustment would be appropriate if current

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33/ See FAS 123R, paragraph A21.

34/ AU sec. 328 provides general guidance about evaluating a company's assumptions.

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grants have four-year vesting. The volatility of the company's stock price also can affect whether vested employees (1) exercise the options, (2) terminate from the company and exercise the options, (3) terminate from the company and let the options lapse, or (4) stay with the company through the contractual term and let the options lapse. Announced plans for acquisitions, divestitures, and initial public offerings of stock also could affect employee exercises and forfeitures.

The auditor should evaluate whether the amount of an adjustment is reasonable by reviewing the support for the adjustment. The auditor also should be alert to the risk of management override in the adjustments.

Range of expected terms. If a company, after analyzing its historical data, developed a range of possible expected terms that are each equally likely, the auditor should verify that the company selected the average of the amounts in the range (the expected value according to paragraph A20 of FAS 123R).

Use of SAB 107 "simplified method." According to SAB 107, the simplified method of estimating expected term is permitted only for "plain vanilla" options.[35/] If a company uses the simplified method, the auditor should review the evidence that supports the company's view that it is eligible to use the simplified method. Specifically, the auditor should review the grant documentation to ensure that the terms conform to the "plain-vanilla" requirements, review pre-vesting terminations to ensure that the associated share options were cancelled, and test whether exercises by terminated employees occurred within a limited time after termination (typically 30 to 90 days).

[35/] The interpretative response to question 5, section D.2 of SAB 107, establishes basic characteristics of share option plans that are sometimes referred to as "plain vanilla." The basic characteristics are: (1) share options are granted at-the-money, (2) exercisability is conditional only on performing service through the vesting date, (3) if an employee terminates service prior to vesting, the employee would forfeit the share options, (4) if an employee terminates service after vesting, the employee would have a limited time to exercise the share options (typically 30 to 90 days), and (5) share options are nontransferable and nonhedgeable. In addition, the SEC staff has stated that it does not expect the simplified method to be used for share option grants after December 31, 2007 (See the interpretative response to question 6, section D.2.).

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Q11. According to FAS 123R, aggregating individual awards into relatively homogenous groups, with respect to exercise and post-vesting employment termination behaviors, and estimating the fair value of the options granted to each group separately, reduces the risk of potential misstatement of the value of the award.[36/] How should the auditor evaluate the appropriateness of groups of employees used in the estimate of expected term?

> **A11.** If the company segregates the employees into more than one group (such as executives and non-executives), the auditor should perform the following procedures to evaluate the company's employee groups:
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> - Evaluate whether the company aggregated individual awards into relatively homogeneous groups with respect to exercise and post-vesting employment termination behaviors and the evidence and rationale supporting the determination of the groups is adequate;
> - Evaluate the reasonableness and completeness of groups;
> - Evaluate the reasonableness and support for adjustments to historical exercise behavior of groups;
> - Test the underlying data upon which the groups are based (See also PCAOB staff question No. 19); and
> - Evaluate whether the company's calculations of historical exercise behavior for each group are mathematically correct.

Expected volatility

Q12. Paragraph A23 of FAS 123R states that assumptions used to estimate the fair value of share options granted to employees should be determined in a consistent manner from period to period. Paragraphs A32 and A34 provide further guidance related to the company's estimate of expected volatility. How should the auditor

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[36/] See FAS 123R, paragraph A30. In addition, the interpretive response to Question 4 of section D.2. of SAB 107 states that an entity may generally make a reasonable fair value estimate with as few as one or two groupings.

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evaluate the reasonableness of a company's estimate of the expected volatility of its share price?

A12. The auditor should perform the following procedures to evaluate the reasonableness of a company's estimate of expected volatility:[37/]

- Obtain an understanding of the company's process for estimating expected volatility.
- Evaluate whether the company's process considers all of the applicable factors identified in paragraph A32 of FAS 123R in determining its estimate of expected volatility. The auditor also should evaluate whether the process (1) identifies the information necessary to be able to consider the volatility factors and (2) evaluates and weights that information (as required by paragraph A34 of FAS 123R).
- Evaluate the reasonableness of the assumptions, supporting information, judgments, and weightings. Evidence of reasonableness includes whether the company considered all the volatility factors and how such factors might affect the company's estimate of expected volatility. The auditor also should be alert to the risk of management override of the company's process for estimating expected volatility.
- Evaluate the consistency of the company's process for estimating expected volatility from period to period in evaluating the company's compliance with paragraphs A32 and A34 of FAS 123R.[38/] However, the auditor also should consider that when circumstances indicate the availability of new or different information which would

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[37/] AU secs. 342 and 328 provide general guidance for reviewing a company's process and evaluating its assumptions.

[38/] The interpretative response to question 1, section D.1. of SAB 107 states that the process used to gather and review available information to estimate expected volatility should be applied consistently from period to period.

be useful in estimating expected volatility, SAB 107 directs the company to incorporate that information.[39/]

- In general, for historical volatility, verify that the company's process provides for looking back over the expected term (for a closed-form model) or contractual term (for a lattice model)[40/] to consider the extent to which currently available information indicates that future volatility will differ from historical volatility.[41/] A change in a company's business model that results in a material alteration to the company's risk profile is an example of a circumstance in which the company's future volatility would be expected to differ from its past volatility.[42/]

- Test the underlying data used in the estimate (See also PCAOB staff question No. 19).

The auditor also should evaluate whether the person or persons determining the expected volatility assumption, including the company's specialists, have experience in valuing employee share options,[43/] and assess how that evaluation affects the audit procedures.

Historical volatility

Q13. How should the auditor evaluate the reasonableness of a company's estimate of expected volatility when it uses its historical volatility as its expected volatility?

A13. As discussed in the answer to PCAOB staff question No. 12, the auditor should evaluate whether the company's process provides for looking backward to

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39/ Ibid.

40/ See FAS 123R, paragraph A32a.

41/ See FAS 123R, paragraph A34.

42/ See SAB 107, footnote 55.

43/ See AU sec. 328.12.

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determine whether currently available information indicates that expected volatility will differ from historical volatility. The auditor should evaluate whether there is other information that the company did not consider and such information indicates that expected volatility will differ from the past. The auditor could base this evaluation on publicly available information related to the company's corporate history and future plans, and knowledge of the industry. In addition, an indication of the reasonableness of the company's process will be the extent to which the company analyzes each factor with respect to its own facts and circumstances.

Additionally, the auditor should consider the criteria established by SAB 107 for exclusive reliance on historical volatility. The SEC staff has stated that it would not object to a public company placing exclusive reliance on historical volatility when the following factors are present, and the methodology is consistently applied, if the company's common shares have been publicly traded for a sufficient period of time:[44/]

- The company has no reason to believe that its future volatility over the expected or contractual term, as applicable, is likely to differ from its past;
- The computation of historical volatility uses a simple average calculation method;
- A sequential period of historical data at least equal to the expected or contractual term of the share option, as applicable, is used; and
- A reasonably sufficient number of price observations are used, measured at a consistent point throughout the applicable historical period.

The auditor also should verify that the company has properly calculated the historical volatility.

44/ See SAB 107, section D.1., "Company B" example.

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If a company makes adjustments to historical volatility based on peer company data, the auditor should evaluate the reasonableness of the company's decision to use peer company data. In addition, the auditor should evaluate whether the company is using an appropriate peer group, the company is reasonably comparable to the peer group, and management reasonably blended peer group data and its own company data. The auditor also should be alert to the risk of management override in the area of adjustments to historical volatility.

Q14. FAS 123R indicates that a company should consider historical volatility over a period generally commensurate with the expected term or contractual term, as applicable. How should the auditor evaluate whether a company, in determining its expected volatility, has considered the historical volatility of its share price over an appropriate period of time?

A14. The auditor should evaluate whether the company considered the volatility of its share price over the most recent period that is generally commensurate with the expected term (or contractual term if a lattice model is used). For example, if a company estimated that the expected term of the options is four years, then the company generally should start with its historical volatility for the most recent four-year period in determining the expected volatility.

The following are circumstances that indicate increased inherent risk and might also indicate increased risk of fraud.

- The company used a period of historical data that is longer than the expected term,[45/] and the effect is to lower expected volatility and the resulting fair value, or the company did not consistently use the longer period. Using a period of historical data longer than expected or contractual term is acceptable under SAB 107 if the company reasonably believes that the additional historical information will improve the estimate. However, this situation is similar to the condition described in PCAOB staff question No. 4, in

[45/] See the interpretative response to question 2, section D.1 of SAB 107. SAB 107 also points out that paragraph A32a of FAS 123R indicates companies should consider historical volatility over a period generally commensurate with expected or contractual term.

which an adjustment to historical exercise behavior or share price volatility that results in a lower expected term or expected volatility increases inherent risk and might indicate a heightened risk of fraud.

- The company used a method that weights the most recent periods of a company's historical volatility more heavily than earlier periods, especially if the result is a lowering of expected volatility.[46/]

- The company excludes a period of time from the calculation of historical volatility, especially if doing so results in a decrease of expected volatility, and hence a decrease in fair value.[47/]

Q15. How should the auditor evaluate the company's share price observations for the purpose of determining historical volatility?

A15. The auditor should evaluate whether the company used actual observed prices within intervals that were appropriate based on the facts and circumstances and that provide a basis for a reasonable estimate. For example, if a company's shares are thinly traded, then weekly or monthly price observations may be more appropriate than daily price observations.[48/] The auditor also should verify that the price observations are taken consistently

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46/ See SAB 107, interpretative response to question 2, section D.1, including footnote 40. SAB 107 states that such weighting may not be appropriate for longer term employee share options and that an estimate of expected volatility that places "extreme emphasis on the most recent periods" may not be consistent with paragraph A32(a) of FAS 123R.

47/ See SAB 107, interpretative response to question 2, section D.1. SAB 107 states that if a company disregards a period of historical volatility, it should be prepared to support its conclusion that its historical share price during that previous period is not relevant to estimating expected volatility due to one or more discrete and specific historical events and that similar events are not expected to occur during the expected term of the share option. SAB 107 states that these situations would be rare.

48/ See SAB 107, footnote 42.

throughout the period and are consistent with the approach used in prior grants. For example, if a company uses weekly price observations, then the auditor should verify that the company made the observation on the same day of each week. In addition, if the company changes when it makes price observations, for example, from daily price observations to monthly, the auditor should evaluate the reasonableness of the company's rationale for the change.

Implied volatility

Q16. Implied volatility is inferred by calculating volatility using an option-pricing model (typically Black-Scholes-Merton), where the fair value—the market price of a company's appropriate traded financial instruments—and other variables are known (i.e., share price, exercise price, expected term, risk-free rate, and expected dividends). How should the auditor evaluate a company's use of implied volatility in its estimate of expected volatility?

A16. SAB 107 provides items for a company to consider when using implied volatility. Accordingly, in such situations, the auditor should evaluate whether a company with "appropriate traded financial instruments from which they can derive an implied volatility"[49/] has appropriately taken into account implied volatility in determining the estimate of expected volatility.

For companies with exchange-traded options, or other appropriate traded financial instruments,[50/] the auditor should evaluate whether the company's process for estimating expected volatility is appropriate and consistent from period to period.[51/] A company that considers implied volatility will probably do so as part of its overall process for estimating expected volatility. Therefore, the auditor also should consider the concepts described in PCAOB staff question Nos. 3 and 12.

49/ See SAB 107, interpretative response to question 1, section D.1.

50/ Ibid. Under SAB 107, appropriate traded financial instruments could include actively traded options or financial instruments with embedded options.

51/ See SAB 107, interpretative responses to question 3, section D.1, regarding the use of implied volatility.

STAFF QUESTIONS & ANSWERS

Regarding exclusive reliance on implied volatility, the SEC staff has stated that it would not object to a public company placing exclusive reliance on implied volatility when certain factors are present and the methodology is consistently applied, if the company's common shares have been publicly traded for a sufficient period of time and the company has multiple options on its shares outstanding that are traded on an exchange.[52/]

If the company places exclusive reliance on implied volatility based on its assessment that the factors in SAB 107 are present, the auditor should evaluate that assessment. In addition, the auditor should verify that the company has properly calculated the implied volatility.

Combined volatility

Q17. How should the auditor evaluate the reasonableness of a company's estimate of expected volatility when it uses a combination of historical and implied volatility in that estimate?

A17. The auditor should verify that the company's process for estimating expected volatility includes consideration of the applicable factors for using historical or implied volatility, as discussed in FAS 123R and SAB 107. PCAOB staff question Nos. 13 through 16 provide guidance for the auditor to use when evaluating the company's use of historical volatility, including the effects of any adjustments, and implied volatility in its estimate of expected volatility. In considering the reasonableness of the combined expected volatility, the auditor should evaluate the company's consideration of the factors that affect volatility, including the SEC staff's factors for exclusive use of implied or historical volatility, and the company's support for its conclusions. The factors outlined in SAB 107 for a company's exclusive use of either historical volatility or implied volatility also may provide some relative benchmarks for the auditor to use in evaluating the combined volatility.

[52/] See SAB 107, section D.1., Company B example, and interpretative response to question 4, section D.1.

STAFF QUESTIONS & ANSWERS

Risk-free interest rate(s) and expected dividends

Q18. FAS 123R requires that the valuation method, such as the Black-Scholes-Merton formula or lattice models, consider the expected dividends of the underlying shares for the expected term and the risk-free interest rate(s) for the expected term. How should the auditor evaluate whether the company has properly considered these two elements?

> **A18.** The risk-free interest rate(s) and the expected dividends assumption generally are less subjective than the expected term and volatility assumptions and also do not have as significant an effect on the estimate of fair value. However, the auditor still should evaluate the reasonableness of those assumptions.
>
> *Risk-free interest rate*. In general, the risk-free rate is the yield on a zero-coupon U.S. Treasury bond with a remaining term equal to the option term. A higher risk-free interest rate increases the option value and hence the estimated fair value, all other factors being equal.
>
> If the company uses the Black-Scholes-Merton formula, the auditor should verify that the company used a traded zero-coupon U.S. Treasury bond with a remaining term equal to the expected term, measured on the grant date. The auditor also should verify that the company properly calculated the yield based on the traded price. If the company interpolated a yield because the expected term fell within the remaining terms of two bonds, the auditor should evaluate the accuracy of the interpolation.
>
> If a company's lattice model incorporates a term structure of expected volatilities, the company might use a yield curve for the contractual period. If the company's lattice model uses a yield curve, the auditor should verify that the company properly calculated the yield curve and accurately entered the yields into the lattice model.
>
> *Expected dividends.* The dividend yield over the option term affects the option value because it reduces the stock price on the ex-dividend date. In general, higher expected dividends decrease the value of the option and hence the estimated fair value. The auditor should:

- Evaluate whether the company has the intent and ability to pay the dividends that are embodied in the expected dividend assumption. Sufficient cash and observable trends provide evidence of the company's intent and ability to pay dividends.[53/]

- If the company has adjusted its current or historic dividend yield, evaluate the reasonableness of and support for the expected dividend yield. The auditor should evaluate whether the expected dividend yield is consistent with management's plans and information available to market participants by reviewing evidence such as press releases on dividend policy changes and historical dividend yield rates. This evaluation should include whether the company failed to make an adjustment to expected dividends.

- Test the underlying data (See also PCAOB staff question No. 19).

Validation of Data and the Option-pricing Model

Q19. How should the auditor test the underlying data that supports a company's estimate of fair value, and the related entries?

> **A19.** Pursuant to AU sec. 328.39, the auditor should test the data used to develop the fair value measurements and evaluate whether the fair value measurements have been properly determined from such data and management's assumptions. This includes evaluating whether the data on which the fair value measurements are based, including the data used in the work of a specialist, are accurate, complete, and relevant; and whether fair value measurements have been properly determined using such data and management's assumptions. In considering the controls over data pursuant to AU sec. 328.12, the auditor should consider the effectiveness of the design of controls intended to safeguard the integrity and reliability of the data.

53/ AU sec. 328.17 states that the auditor should evaluate management's intent to carry out specific courses of action where intent is relevant to the use of fair value measurement and that the auditor also should evaluate management's ability to carry out those courses of action.

A number of systems, which can be automated or manual, often provide data relevant to the estimate of fair value. The auditor should identify the automated or manual systems that might be subject to testing. Record-keeping systems for stock plan information and awards are usually critical because information about forfeitures and exercises supports the company's estimate of expected term. Payroll, human resources, and tax systems also could be critical if they contain information about awards, forfeitures, and exercises that is used in the estimation process.[54/]

The auditor also should establish that any data used that resides outside the company are reliable, such as peer group data. AU sec. 329.16 provides guidance for evaluating the reliability of such data.

Q20. How should the auditor evaluate whether the model has appropriately calculated the fair value estimate for share options?

A20. If the company is using the Black-Scholes-Merton formula, the auditor should verify that the company is using the correct formula and recalculate the fair value. If the company is using a lattice option-pricing model, the auditor should obtain evidence that the model is functioning properly.

Role of Specialists

Q21. What is the role of a specialist in auditing estimates of the fair value of employee share option grants?

A21. AU sec. 328 provides guidance on auditing fair value measurements and disclosures, including auditing the fair value of employee share option grants. According to AU 328.12, as part of obtaining an understanding of the process management uses to determine fair value, such as the fair value of employee

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[54/] See AU sec. 328.12. When obtaining an understanding of the company's process for determining fair value measurements and disclosures, the auditor should consider the extent to which the company relies on a service organization to provide data that supports the measurement. When a company uses a service organization, the auditor should consider the requirements of AU sec. 324, *Service Organizations*.

share option grants, the auditor should consider the extent to which management engages or employs specialists.

When testing fair value measurements and disclosures, the auditor should, among other things, perform procedures to evaluate whether management's assumptions are reasonable and to evaluate the source and reliability of evidence supporting management's assumptions.[55/] According to AU sec. 328.05, footnote 2, management's assumptions include any assumptions developed by a specialist engaged or employed by management. Thus, the auditor should perform procedures in accordance with AU sec. 328 to evaluate the assumptions developed by a specialist engaged or employed by management.

Pursuant to AU sec. 328.20, the auditor should consider whether to engage a specialist and use the work of that specialist as evidential matter in performing substantive tests to evaluate material financial statement assertions related to the fair value of employee share option grants. In making this decision, the auditor[56/] should evaluate whether he or she has the necessary skill and knowledge to plan and perform audit procedures related to the fair value of employee share option grants, including the reasonableness of the assumptions that the company or its specialist used.

The following circumstances related to the company's fair value measurement under FAS 123R often are particularly complex, involve assumptions that have a significant effect on fair value and, thus, might result in a higher assessment of risk by the auditor. Accordingly, the auditor should evaluate whether he or she has the necessary skill and knowledge to plan and perform audit procedures in these areas.

55/ See AU secs. 328.26a and 328.31.

56/ In this context, the term *auditor* includes employees of the auditor's firm who possess relevant special skill or knowledge and who participate in the audit as a member of the audit team.

STAFF QUESTIONS & ANSWERS

- Use of a lattice model, including obtaining evidence that the model is functioning properly. (See PCAOB staff questions No. 5, 18, and 20.)

- Exclusion of periods of historical data. (See PCAOB staff questions No. 4 and 14.)

- Adjustments to historical exercise behavior or historical share price volatility that result in shorter expected term or lower expected volatility than the company's historical experience. (See PCAOB staff questions No. 4, 10, and 14.)

- Use of a method that weights the most recent periods of a company's historical volatility more heavily than earlier periods, especially if the result is a lowering of expected volatility. (See PCAOB staff question No. 14.)

- Use of combined volatility. (See PCAOB staff question No. 17.)

Q22. What should the auditor do to satisfy the requirement that he or she evaluate the qualifications of a specialist?

A22. Valuation specialists may have certain areas of experience. When evaluating the qualifications of a specialist in accordance with AU sec. 336.08,[57/] the auditor should evaluate whether the specialist has experience in valuing employee share options. In doing this, the auditor should evaluate the experience of the specialist's firm and of the individual specialist, or specialists, performing the service.

[57/] Pursuant to AU sec. 336.08a and b, the auditor should also consider the specialist's certification, license, or other recognition of competence and the specialist's reputation.