ARMED SERVICES BOARD OF CONTRACT APPEALS

Appeal of --	)	
	)	
Luna Innovations, Inc.	)	ASBCA No. 60086
	)	
Under Contract No. N68335-05-C-0005 *et al.*	)	

APPEARANCES FOR THE APPELLANT: Nicole D. Picard, Esq.
Michael J. Vernick, Esq.
Hogan Lovells US LLP
Washington, DC

APPEARANCES FOR THE GOVERNMENT: E. Michael Chiaparas, Esq.
DCMA Chief Trial Attorney
Gregory T. Allen, Esq.
Trial Attorney
Defense Contract Management Agency
Chantilly, VA

OPINION BY ADMINISTRATIVE JUDGE D'ALESSANDRIS

Luna Innovations, Inc. (Luna) appeals from a contracting officer's final decision determining that Luna included unallowable employee stock option costs in its fiscal year (FY) 2007 indirect cost pricing proposal, and assessing penalties against Luna due to the inclusion of expressly unallowable costs. As a publically-traded company, Luna was required by Generally Accepted Accounting Principles (GAAP) to account, at the time of award to its employees, for the stock options that could be exercised in later years. Pursuant to Statement of Financial Accounting Standards No. 123 (revised 2004) (FAS 123r), Luna calculated the value of the awarded stock options pursuant to the "Black-Scholes" method. The Defense Contract Management Agency (DCMA) contracting officer found that Luna's use of the Black-Scholes model violated Federal Acquisition Regulation (FAR) 31.205-6(i) which makes unallowable compensation for personal services calculated or valued based on changes in stock price, because one of the five variables used by the model was the variance of the stock price. In this appeal, Luna asserts that its employee stock option costs were allowable and, even if the costs were not allowable, they were not "expressly unallowable" and thus were not subject to penalty, and finally, even if the costs were expressly unallowable, the contracting officer should have waived the penalties. As explained below, we hold that Luna's employee stock option costs were unallowable, but not expressly unallowable, and uphold the government's final decision in part.

FINDINGS OF FACT

Luna Innovations, Inc.

Luna is a corporation headquartered in Roanoke, Virginia. Currently, its largest line of business is based on optical fiber technologies. Additionally it has a technology development business, which largely involves government contracts through the small business innovative research program. (Compl. ¶ 1; tr. 1/19-20) During the time period at issue, much of Luna's government work was performed for components of the Department of Defense on a cost-reimbursable basis (R4, tabs 1-3). Approximately $14 million of Luna's business, out of a total $60 million, is performed pursuant to contracts with the United States (tr. 1/20).

Luna's fiscal year is the calendar year (R4, tab 4 at 62; tr. 1/21). During its FY 2007, Luna held open government cost-reimbursement contracts containing FAR 52.216-7, ALLOWABLE COST AND PAYMENT (MAR 2000); FAR 52.233-1, DISPUTES (DEC 1998); and FAR 52.242-3, PENALTIES FOR UNALLOWABLE COSTS (OCT 1995). The Allowable Cost and Payment clause incorporates by reference: (1) subpart 31.2 of the FAR in effect on the date of the contract; and (2) subpart 42.7 of the FAR in effect for the period covered by the indirect cost rate proposal. (R4, tab 1 at 7-8, tab 2 at 30-31, tab 3 at 51-52; tr. 1/21)

In June 2006, Luna completed an Initial Public Offering (IPO) of its common stock (tr. 1/29). As a publically-traded company, Luna became subject to certain additional accounting rules, including rules for accounting for employee stock options (tr. 1/28-29). As a part of its employee compensation program, Luna issued stock options to select employees and corporate officers during its FY 2007 (R4, tab 4 at 65-66; tr. 1/22). Although Luna had previously issued employee stock options, its prior accounting treatment was not permissible once Luna became a publically-traded company (tr. 1/142). Luna's employee stock options generally had a 10-year term, and had a strike price (the price at which the option could be exercised) set equal to the current market price (tr. 1/28, 142).

FAS 123r

As a publically-traded company, Luna was required to comply with FAS 123r. The purpose of FAS 123r is to recognize, in the current period financial statements, the contingent financial liability represented by the employee stock option. Accordingly, FAS 123r provides that its objective is to recognize "the employee services received in exchange for equity instruments issued or liabilities incurred and the related costs to the

entity as those services are consumed" (app. supp. R4, tab 71, ¶ 9). The provision is intended to:

> [E]stimate the fair value at the grant date of the equity instruments that the entity is obligated to issue when employees have rendered the requisite service and satisfied any other conditions necessary to earn the right to benefit from the instruments (for example, to exercise share options). That estimate is based on the share price and other pertinent factors, such as expected **volatility,** at the grant date.

(App. supp. R4, tab 71, ¶ 16) The standard defines volatility as:

> A measure of the amount by which a financial variable such as a share price has fluctuated (historical volatility) or is expected to fluctuate (expected volatility) during a period. Volatility also may be defined as a probability-weighted measure of the dispersion of returns about the mean. The volatility of a share price is the standard deviation of the continuously compounded rates of return on the share over a specified period. That is the same as the standard deviation of the differences in the natural logarithms of the stock prices plus dividends, if any, over the period. The higher the volatility, the more the returns on the shares can be expected to vary—up or down. Volatility is typically expressed in annualized terms.

(*Id.*) Thus, FAS 123r requires companies to recognize, at the time of award, the expected future liability, including possible appreciation, in the security price.

The standard does not require the use of a particular valuation method so long as it complies with specific provisions of the standard, including paragraph 16 cited above (app. supp. R4, tab 71 at 41, ¶ A14). One permissible method to measure the value of the stock options as identified in the standard is a calculation known as the Black-Scholes model (tr. 1/24; app. supp. R4, tab 71, ¶ A15).

Black-Scholes Model

The Black-Scholes model, also referred to as the Black-Scholes-Merton model, is a method of estimating the value of a stock option. *See* FISCHER BLACK & MYRON

SCHOLES, *The Pricing of Options and Corporate Liabilities*, JOURNAL OF POLITICAL ECONOMY 637 (May-June 1973).[1] The basic formula is:

$$\text{Call Price (value of the option)} = SN(d_1) - e^{-(R_f)(t)}XN(d_2)$$

$$d_1 = \frac{\ln\left(\frac{S}{X}\right)+(R_f+\sigma^2/2)t}{\sigma t^{\frac{1}{2}}}$$

$$d_2 = d_1 - \sigma t^{1/2}$$

Where $N(\cdot)$ is the cumulative standard normal function;
t is years to maturity;
S is the current stock price;
X is the strike price;
R_f is the risk-free interest rate; and
σ is the annualized volatility (measured from prior years).

(App. supp. R4, tab 7 at 20)

As illustrated above, the model relies upon five inputs: the term of the option (t); the current stock price (S); the exercise (strike) price (X); the risk-free rate of return (R_f); and the stock price variance (σ) (tr. 1/24-25; app. supp. R4, tab 7 at 20). Reviewing the differential equations in the Black-Scholes model, it is apparent that the option price is a function of historical stock price volatility and that changes in the price of the underlying stock after the valuation date do not influence the value of the stock option. In essence the model treats the stock option as a forward contract to deliver the stock at the end of the option period.

Luna's Treatment of Employee Stock Options

In accordance with FAS 123r, Luna recorded the expense for stock options issued during FY 2007 based on the fair market value of the option at the grant date. Luna recorded $2,291,700 in compensation expense during FY 2007 as estimated using the European option no dividend[2] version of the Black-Scholes model. (Tr. 1/22-26, 71; R4,

---

[1] While the Black-Scholes formula is in the record of this appeal, the original Black-Scholes paper is not part of the record. The paper is cited solely to provide context to the record testimony and documents.

[2] Luna used the basic Black-Scholes European model without dividends. The model can be adjusted for different factual scenarios, including payment of dividends or to model "American" options. A "European" option can only be exercised on the last day of the option period, while "American" options can be exercised anytime during the option period. BLACK & SCHOLES, *The Pricing of Options and*

tab 4 at 65) Luna calculated the Black-Scholes value using the following data: (1) the price of Luna's common stock at the date of the grant; (2) the current yield of the United States Treasury's zero coupon note maturing on the date closest to the expiration date of the option; (3) the price volatility of asset return for comparable technology companies; (4) the strike price, which was set equal to current stock price; and, (5) a 7.5 year option period reflecting the midpoint between complete vesting of the options at 5 years and the expiration of the options at 10 years (tr. 1/24-28, 35, 53-59, 68; supp. R4, tab 14 at 176, tab 18, at 204).

Luna was not able to use its own stock price history to calculate the price volatility of asset return because there was not sufficient historical activity upon which it could reliably base the calculation. In the understanding of Luna's chief financial officer, the minimum period of trading required for such a calculation would have been approximately two years. (Tr. 1/30) Because Luna did not have sufficient history of trading in its own shares, it used the average of the volatility of the shares of: (1) Symyx Technologies; (2) Altair Nanotechnologies; (3) Westaim; (4) Arrowhead Research; (5) Nanophase Technologies; (6) Lumera; (7) II-VI Inc.; and (8) Nano-Proprietary as an index value. These eight companies were suggested to Luna as being comparable to it by ThinkEquity, the investment banking firm Luna used to market its IPO. The mean volatility percentage derived from the eight companies' annual reports from 2006—63%— was used in Luna's FY 2007 Black-Scholes calculation. (Tr. 1/32-35, 41-44; supp. R4, tabs 10, 18 at 204)

Reviewing the equations above, it is apparent that when, as here, the strike price is set equal to the market price, the Black-Scholes value is predominately a function of the volatility of the stock and the risk-free rate of return. As the stock's market price did not exceed the exercise price of the stock options when issued, the Black-Scholes calculation is the expected future price of the stock when the option is exercised, based on volatility, discounted to its present value by the risk-free rate of return.

In preparing its FY 2007 incurred cost submission, Luna retained Mr. Tim Forrest, a former DCAA auditor, to review its submissions (tr. 1/158-59; app. supp. R4, tab 53). During FY 2007, Luna recognized the value of the stock options that it granted based upon the Black-Scholes value and an estimated forfeiture rate and then amortized the options ratably over the vesting period (tr. 1/39-41). On 1 July 2009, Luna submitted a final indirect cost rate proposal for FY 2007 that contained a Certificate of Final Indirect Costs for its "Fiscal Year Ending December 31, 2007." That certificate was signed by its chief financial officer, Dale Messick. (R4, tab 4 at 78; tr. 1/36) The fair market value of the stock options issued during Luna's FY 2007, as estimated by the Black-Scholes

---

Corporate Liabilities, JOURNAL OF POLITICAL ECONOMY at 640. (App. supp. R4, tab 7)

method, was included in the final indirect cost rate proposal submitted by the company for that fiscal year. The General and Administrative Expense (G&A) pool in Luna's certified final indirect cost rate proposal for its FY 2007 thus contained $2,291,790 for stock options claimed as compensation expense. (R4, tab 4 at 65-66; tr. 1/70-71)

The Government's Review of Luna's Employee Stock Option Expense

As part of its review of Luna's FY 2007 incurred cost submission, the Defense Contract Audit Agency (DCAA) conducted research and discussed internally whether Luna's stock option costs were allowable pursuant to FAR 31.205-6 (tr. 1/88-96; app. supp. R4, tabs 57, 59, 63). In a 27 May 2014 email, Mr. Dennis Richards, a senior auditor at DCAA, conferred with a DCAA compensation auditor, noting, "From what I've found, the only time stock option expense is allowable is when the fair market value exceeds the exercise price," but indicating that he was still trying to determine the proper basis for questioning the costs. (App. supp. R4, tab 57) In August 2014, Mr. Richards contacted Ms. Mary Pace, a DCAA technical specialist in Cost Accounting Standards (CAS) and a certified public accountant, inquiring whether the use of the Black-Scholes method made the costs unallowable simply because changes in stock price was an input in the model (app. supp. R4, tabs 57, 59).

Ms. Pace responded in a 16 September 2014 email that the costs should be questioned pursuant to FAR 31.205-6(k), "Deferred compensation other than pensions" rather than FAR 31.205-6(i) because, in future years "if Luna were to award the options at a price lower than the market value, they would have allowable costs incurred" and "[w]e would be questioning the costs erroneously under FAR 31.205-6(i)" (app. supp. R4, tab 63; *see* tr. 1/96, 107-08).

On 30 September 2014, DCAA issued Audit Report No. 1281-2007A10100913, "Independent Audit of Luna Innovations Incorporated's (Luna) Fiscal Year 2007 Incurred Cost Proposal" (R4, tab 4). In the Audit Report, DCAA questioned the $2,291,790 of employee stock option costs that Luna included in its claimed compensation expenses in its G&A pool. DCAA questioned these costs based on FAR 31.205-6(i), Compensation for personal services.

FAR 31.205-6(i)(1) provides:

> (i) *Compensation based on changes in the prices of corporate securities or corporate security ownership, such as stock options, stock appreciation rights, phantom stock plans, and junior stock conversions.*

> (1) Any compensation which is calculated, or valued, based on changes in the price of corporate securities is unallowable.

The Audit Report also recommended a penalty on the portion of the unallowable stock option cost that was allocable to contracts subject to the penalties for unallowable costs clause in the amount of $834,441 as described below (R4, tab 4 at 65-66, 68).

On 24 June 2015, administrative contracting officer John J. Cronin issued a contracting officer's final decision concerning Luna's FY 2007 final indirect cost rate proposal. The final decision disallowed $2,291,790 from the G&A Expense pool as unallowable stock option costs claimed as compensation expense pursuant to FAR 31.205-6(i)(1) and demanded payment by Luna of $1,141,421 as a penalty pursuant to FAR 52.242-3, Penalties for Unallowable Costs. The penalty amount determined by Mr. Cronin included $834,441 as the portion of the $2,291,790 disallowed under FAR 31.205-6(i)(1) that was allocable to contracts subject to the Penalties for Unallowable Costs clause. He determined Luna had been reimbursed for these expressly unallowable costs through its interim billings, and included an interest component of $211,647, pursuant to FAR 52.242-3(d)(2), in the total penalty amount he demanded from Luna. (R4, tab 6 at 96-98)

Mr. Cronin's final decision also unilaterally set Luna's final indirect cost rates for its FY 2007 by removing the claimed employee stock option expense (R4, tab 6 at 97). As a result of Mr. Cronin's unilateral indirect rate determination, he demanded $95,333 from Luna as an overpayment resulting from the difference between Luna's billing rates and the unilateral indirect rates he had established as applied to open cost-type contracts that were overbilled (*id.* at 98, 103; tr 1/177). The final decision demanded a total of $1,141,421 (R4, tab 6 at 98).

On 17 July 2015, Luna filed a timely notice of appeal of Mr. Cronin's final decision with the Board. The Board docketed Luna's appeal on 20 July 2015 as ASBCA No. 60086. The Board held a two-day hearing on entitlement on 24 and 25 January 2017.

DECISION

I. Employee Stock Option Costs Estimated by the Black-Scholes Model are Unallowable

Generally, the government bears the burden of proof in demonstrating that costs are unallowable. *See, e.g., Raytheon Co.*, ASBCA No. 57576 *et al.*, 15-1 BCA ¶ 36,043 at 176,050. The resolution of this appeal turns on whether Luna's employee stock options, valued using the Black-Scholes model, constitute compensation that is determined by

changes in stock prices and are, thus, unallowable by the terms of the FAR. The government asserts that Luna's claimed employee stock option costs are unallowable pursuant to FAR 31.205-6(i), which prohibits "compensation which is calculated, or valued, based on changes in the price of corporate securities" because one of the variables in the Black-Scholes model is the price volatility of asset return (gov't br. at 9-13). Luna argues that its employee stock option costs are allowable because employee compensation is an allowable cost pursuant to FAR 31.205-6(d) and because FAR 31.205-6(i) does not make costs such as those calculated by the Black-Scholes model unallowable (app. br. at 15-16).

According to Luna, FAR 31.205-6(i) only prohibits stock option costs that are "calculated or valued 'based on' the underlying stock's volatility" (*id.* at 16). Luna argues that the plain meaning of "based on" requires that something be "derived from or primarily comprised of" something (*id.*), but that asset volatility is only one of five variables in the Black-Scholes model. Luna additionally attempts to distinguish the Board's holdings in *Raytheon*, 15-1 BCA ¶ 36,043 and *Exelis Inc.*, ASBCA No. 58966, 17-1 BCA ¶ 36,708, because the stock options in those cases were calculated "heavily -- if not solely" on changes in stock prices (app. br. at 16-18). As explained in more detail below, *Raytheon* and *Exelis* involved employee compensation plans with benefits calculated based on the company's stock price performance relative to its peers.

In interpreting the FAR we first look to the plain meaning of the words of the regulation in their ordinary use. *See, e.g., LSI Computer Systems, Inc. v. Int'l Trade Comm'n*, 832 F.2d 588, 590 (Fed. Cir. 1987). Here, the FAR makes unallowable "[a]ny compensation which is calculated, or valued, based on changes in the price of corporate securities." FAR 31.205-6(i)(1). As explained above, in the Black-Scholes model the share price (S) is valued on the valuation date, and changes in the share price over time are not factored into the estimated value generated by the model.[3] However, the historical share price volatility (σ), as determined at the time of award of the option, is an input into the model. FAS 123r defines volatility as a "measure of the amount by which a financial variable such as a share price has fluctuated (historical volatility) or is expected to fluctuate (expected volatility) during a period" (R4, tab 71 at 281). Thus, we find that the share price volatility represents changes in the price of corporate securities. Next we consider whether the Black-Scholes model's use of historical volatility in estimating the value of the stock option means that the model is "calculated, or valued, based on" changes in the price of corporate securities.

The Oxford American Dictionary defines "valued" as "estimat[ing] the monetary worth of (something); *his estate was valued at $45,000.*" NEW OXFORD AMERICAN DICTIONARY (3d ed. 2010). Clearly the Black-Scholes model "values" a stock option, so the stock option cost is unallowable if the value is "based on" share price volatility, which

[3] The Black-Scholes formula only uses the stock price at the time of valuation (here valuation was at the time of award) in calculating the value of a stock option.

is, by the definition in FAS 123r, a change in the price of corporate securities. The dictionary defines "based" on as "hav[ing] as the foundation for (something); use as a point from which (something) can develop; *the film is **based on** a novel by Pat Conroy | inaccurate conclusions based on incomplete facts*." NEW OXFORD AMERICAN DICTIONARY. Here, the volatility measure is one of the most important, if not the most important, inputs into the Black-Scholes model, such that the compensation is "based on" on asset volatility. Thus, the output of the Black-Scholes model is unallowable because it is "valued, based on changes in the price of corporate securities."

Luna argues that FAR 31.205-6(i) must be interpreted narrowly, so as not to make irrelevant FAR 31.205-6(d) providing that allowable compensation paid or to be paid in the future includes payment in corporate securities (app. br. at 16 & n.6). However, Luna's argument fails because stock options of the type at issue are not the only types of compensation described in FAR 31.205-6(d). Luna has not established that FAR 31.205-6 would be rendered superfluous by our reading of FAR 31.205-6(i). For example, an award of stock, rather than an option for future purchase, would not appear to violate FAR 31.205-6(d). Additionally, the DCAA auditor Dennis Richards testified that employee stock option costs could be allowable if they were valued without using an option pricing model (tr. 1/107).

Luna additionally contends that the FAR's use of the term "based on" implies that the "subject is derived from or primarily composed of its object" and that the regulation would have said "using" or "employing" if it intended to prohibit any use of changes in share value (app. br. at 16). As established above, the plain meaning of FAR 31.205-6(i) makes Luna's employee stock option costs unallowable. That Luna believes that different wording would be clearer is of no importance. Additionally, in *Raytheon* we held that the fact that the benefit was calculated based on Raytheon's stock price performance relative to its peers was irrelevant and that "in order to be unallowable the award...need not be solely dependent upon the change in price," *Raytheon*, 15-1 BCA ¶ 36,043 at 176,055. Moreover, we note that Luna performed an experiment where it ran the Black-Scholes model for the 5 months from January to August 2007 in which Luna awarded employee stock options, but with the volatility variable set to zero[4] and found that the Black-Scholes option value was approximately 43 to 44 percent of option value calculated in its incurred cost submission (app. supp. R4, tab 7; tr. 1/170-72). Thus, with stock price volatility removed from the model, the calculated value of the stock options declined by over half. Hence, even under Luna's favored interpretation of the FAR, the stock option price was "primarily composed of" the change in security prices, and would satisfy Luna's proffered definition of "based on."

Luna asserts that its use of the Black-Scholes model is not inconsistent with the FAR because its share price volatility was not based on the volatility of its own stock,

[4] Luna actually used a volatility of .0000001 so as not to divide by zero (tr. 1/170).

but rather on the volatility of the stock of comparable firms (app. br. at 16). We rejected a similar argument in *Raytheon.* In *Raytheon*, the contractor had a long-term performance plan (LTPP) that granted stock share awards to "key business leaders" upon the recommendation of Raytheon senior management. To determine compensation under the LTPP, Raytheon calculated the Total Shareholder Return (TSR) using the formula TSR = (Ending stock price + 3 years dividends) ÷ beginning stock price. Raytheon calculated the TSR for its own stock as well as for ten peer companies. Raytheon then rank-ordered the TSRs and awarded additional shares of stock to the LTPP participants based on Raytheon's relative TSR ranking, with a higher Raytheon TSR ranking generally resulting in the award of more shares of stock. *Raytheon*, 15-1 BCA ¶ 36,043 at 176,052-54.

We noted that the plain language of the cost principle applied to "changes in the price of corporate securities" and that the compensation in the *Raytheon* appeal "clearly and expressly falls under this proscription." *Raytheon*, 15-1 BCA ¶ 36,043 at 176,055. Thus, the cost principle does not distinguish between changes in the price of a company's own securities and securities in general. Rather, as explained in more detail below, the concern is that compensation based on changes in the price of securities does not represent work actually performed. Moreover, it is worth noting that Luna awarded its stock options with the strike price set equal to the market price. Thus, if the recipient were to exercise the options at the time of award, there would be no benefit to the recipient. Thus, any market value to the option must be based on an expectation that the market price of the underlying security will increase during the term of the option.

Luna also attempts to distinguish the holdings in *Raytheon* and *Exelis* because the TSR compensation metric employed in those cases was directly based on changes in stock prices (app. br. at 17-19). In *Exelis*, the contractor used a compensation scheme similar to that in *Raytheon*, but with cash bonuses from a set award pool. *Exelis,* 17-1 BCA ¶ 36,708 at 178,746-47.

We agree with Luna that the TSR scheme employed in *Raytheon* and *Exelis* more clearly violates the terms of FAR 31.205-6(i) than does Luna's use of the Black-Scholes model. However, the plain language of FAR 31.205-6(i) makes the value of Luna's employee stock options an unallowable cost. The fact that other costs were more clearly unallowable is of no importance. Luna additionally argues that unlike the TSR calculation in *Raytheon* and *Exelis* the value of its stock options is fixed at the time of award, and that future stock price changes do not affect the employee's award (app. br. at 21). While, true, it is also irrelevant. Luna's employee stock option costs are unallowable under the plain language of the FAR, accordingly, our analysis stops there.

II. Luna's Claimed Employee Stock Option Costs Were Not "Expressly Unallowable"

Having found that Luna's employee stock option expenses were unallowable, we next determine whether the costs were "expressly unallowable" as defined by the FAR. An expressly unallowable cost is a "particular item or type of cost which, under the express provisions of an applicable law, regulation, or contract, is specifically named and stated to be unallowable." FAR 31.001. If the contracting officer determines that a contractor has submitted an expressly unallowable cost for reimbursement then the contractor shall be assessed a penalty. FAR 52.242-3(d). As the assessment of a penalty is a government claim, the government bears the burden of proof. *Fiber Materials, Inc.*, ASBCA No. 53616, 07-1 BCA ¶ 33,563 at 166,256.

The Board applies an objective standard in determining whether a cost is expressly unallowable. *General Dynamics Corp.*, ASBCA No. 49372, 02-2 BCA ¶ 31,888, *rev'd in part on other grounds*, *Rumsfeld v. General Dynamics Corp.*, 365 F.3d 1380 (Fed. Cir. 2004). However, "Congress adopted the 'expressly unallowable' standard to make it clear that a penalty should not be assessed where there were reasonable differences of opinion about the allowability of costs" so the "Government must show that it was unreasonable under all the circumstances for a person in the contractor's position to conclude that the costs were allowable." *Id.* at 157,570; *Fiber Materials*, 07-1 BCA ¶ 33,563 at 166,256. Moreover, the determination as to whether a cost is expressly unallowable will depend on "the clarity and complexity of the particular cost principle and the circumstances involved." *General Dynamics,* 02-2 BCA ¶ 31,888 at 157,570; *Fiber Materials*, 07-1 BCA ¶ 33,563 at 166,256.

The government asserts that the employee stock option costs were expressly unallowable because FAR 31.205-6(i)(1) specifically names and states that compensation that is calculated or valued based on changes in the price of corporate securities is unallowable (gov't br. at 14). The government relies upon the Board's holdings in *Raytheon* and *Exelis* which found costs disallowed by FAR 31.205-6(i) to be expressly unallowable (gov't br. at 15-18). Luna asserts that employee stock option costs as estimated by the Black-Scholes model were not unreasonable under all circumstances and that there was a reasonable difference of opinion regarding allowability (app. br. at 20). Luna contends that its inclusion of the employee stock option costs was reasonable because of factual differences between the Black-Scholes and the TSR methodology used in *Raytheon* and *Exelis*, a lack of guidance from the government, and internal debate within DCAA and DCMA (*id.* at 20-24).

As Luna notes, there are significant differences between the TSR equation at issue in *Raytheon* and *Exelis* and the Black-Scholes model. Here, Luna first determined the number of shares to be awarded as employee stock options and then used the Black-Scholes model to value the stock options for financial accounting purposes. In

Raytheon, the TSR equation determined the number of shares to be awarded based explicitly on the change in share prices during the evaluation period. Put differently, in *Raytheon* and *Exelis*, the corporation determined the benefit to the recipients *ex post* explicitly looking at performance of share prices. Here, Luna awarded shares of its stock, but valued the stock *ex ante* for financial reporting purposes.

Under the Black-Scholes model, a change in Luna's share price after the valuation date of the options has no effect on the value of the employee stock options as calculated by the Black-Scholes model (app. reply br. at 5-6); however, the actual financial benefit to the recipient will depend on future appreciation in Luna's stock price. Because the options were issued with strike prices set equal to the current share price, if the stock does not appreciate in value, or declines in value, the benefit to the recipient is zero.

In addition to the fundamental differences between the Black-Scholes model and the TSR calculation in *Raytheon*, there are legitimate differences of opinion regarding the allowability of the costs at issue in this appeal. Here, Luna retained the services of a retired DCAA auditor, in preparing its filings (tr. 1/158-59). In addition, Mr. Richards, the DCAA auditor responsible for the audit of Luna's incurred cost submission, testified that the cost of employee stock options can be allowable under certain circumstances (tr. 1/107). Admittedly, the DCAA employees all believed the costs to be unallowable, but they had different interpretations of how the costs should be questioned. Significantly, a DCAA CAS specialist noted in an email that "if Luna were to award the options at a price lower than the market value, they would have allowable costs incurred" and "[w]e would be questioning the costs erroneously under FAR 31.205-6(i)" (app. supp. R4, tab 63; tr. 1/96, 107-08).

Given the complexity of the circumstances, the fact that the use of the Black-Scholes model is a question of first impression, the need to review the differential equations comprising the Black-Scholes model,[5] and the fact that there could be a reasonable difference of opinion regarding the costs, we hold that it was not "unreasonable under all the circumstances" for Luna to claim the employee stock option costs, and hold that the employee stock option costs are not expressly unallowable. *General Dynamics,* 02-2 BCA ¶ 31,888 at 157,570; *Fiber Materials*, 07-1 BCA ¶ 33,563 at 166,256.

Because we hold that Luna's employee stock option expenses were not expressly unallowable, we do not reach the issue of whether the contracting officer properly determined not to waive the penalties.

---

[5] We emphasize here that the Black-Scholes model is a widely recognized model in financial economics and is explicitly referenced in FAS 123r. We may not reach the same conclusion in review of a future contractor's use of a model simply because it is mathematically complex.

CONCLUSION

For the reasons stated above, the appeal is sustained in part and we return the appeal to the parties to negotiate quantum consistent with this decision.

Dated: 29 November 2017

DAVID D'ALESSANDRIS
Administrative Judge
Armed Services Board
of Contract Appeals

I concur

RICHARD SHACKLEFORD
Administrative Judge
Acting Chairman
Armed Services Board
of Contract Appeals

I concur

J. REID PROUTY
Administrative Judge
Vice Chairman
Armed Services Board
of Contract Appeals

I certify that the foregoing is a true copy of the Opinion and Decision of the Armed Services Board of Contract Appeals in ASBCA No. 60086, Appeal of Luna Innovations, Inc., rendered in conformance with the Board's Charter.

Dated:

JEFFREY D. GARDIN
Recorder, Armed Services
Board of Contract Appeals