



DIVISION OF  
CORPORATION FINANCE

UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
WASHINGTON, D.C. 20549-4631

February 3, 2011

Mr. Paul E. Huck  
Senior Vice President and Chief Financial Officer  
Air Products and Chemicals, Inc.  
7201 Hamilton Boulevard  
Allentown, PA 18195

**RE: Air Products and Chemicals, Inc.  
Form 10-K for the year ended September 30, 2010  
Form 10-Q for the quarter ended December 31, 2010  
Schedule 14A filed December 15, 2010  
File No. 1-4534**

Dear Mr. Huck:

We have limited our review to those issues we have addressed in our comments. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure.

Please respond to this letter within ten business days by providing the requested information or by advising us when you will provide the requested response. If you do not believe our comments apply to your facts and circumstances or do not believe an amendment is appropriate, please tell us why in your response.

After reviewing any amendment to your filing and the information you provide in response to these comments, we may have additional comments.

DEFINITIVE PROXY STATEMENT ON SCHEDULE 14A

Compensation of Directors, page 15

1. In future filings, please disclose whether your directors are in compliance with the stock ownership guidelines described in the fourth paragraph.

Compensation of Executive Officers, page 28

Historical Alignment, page 32

2. We note your disclosure in the last paragraph on page 33 that your compensation committee concluded that your compensation program is balanced and does not motivate imprudent risk taking. This disclosure appears to be based on Item

402(s) of Regulation S-K; however, this statement does not conform to the specific language used in Item 402(s). Please advise us as to whether you have determined that your compensation program is not reasonably likely to result in a material adverse effect on your company and the basis for this conclusion. Please also describe to us in greater detail the process you undertook to reach this conclusion.

Components of Compensation, page 37

3. On page 36, we note that you benchmark total direct compensation opportunity for named executive officers at the median value for the Market Reference Group. However, it is unclear from your disclosure whether you benchmark individual components of compensation, such as base salary, annual incentive compensation, and long-term compensation. In future filings, please clearly identify the elements of compensation subject to benchmarking, identify the benchmark for each named executive officer, and disclose where actual payments fell within the targeted parameters for each named executive officer. To the extent actual compensation was outside the targeted range, please explain why. Refer to Item 402(b)(2)(xiv) of Regulation S-K. Using information for your most recently completed fiscal year, please show us in your response what your revised disclosure will look like.

Annual Incentive Plan, page 37

4. In future filings, please discuss in greater detail how you determine the amount of each named executive officer's annual incentive compensation. Refer to Item 402(b)(1)(v) of Regulation S-K. Please disclose how the actual results achieved for each performance goal led to the amount awarded to each named executive officer. Specifically, please disclose the formula you reference in the first paragraph of page 38 and how you used this formula to determine the payout range of 148%-205%. Additionally, please disclose the relationship between the payout range and the 2010 Bonus Factor Schedules for % EPS Growth and ROCE Spread. Using information for your most recently completed fiscal year, please show us in your response what your revised disclosure will look like.
5. We note your statements that the committee determines actual payout factors based on individual and company performance and that the committee can determine a payout factor for each individual executive officer up to the maximum of the range. We further note your discussion in the third full paragraph on page 38. In future filings, please discuss in more detail the specific items of corporate performance and the elements of individual performance and contribution that are taken into account when determining each named executive officer's payout factor. Refer to Item 402(b)(2)(v) and (vii) of Regulation S-K.

Using information for your most recently completed fiscal year, please show us in your response what your revised disclosure will look like.

6. In footnotes 13 and 14 on pages 38 and 40, we note your disclosure that the committee excluded certain extraordinary costs from fiscal year 2010 and 2009 results in determining fiscal year 2010 performance. In future filings, please disclose what costs were excluded. Using information for your most recently completed fiscal year, please show us in your response what your revised disclosure will look like.

Long-Term Incentives, page 38

7. Although you provide general disclosure relating to the procedure for determining the amount of securities granted, your disclosure does not meaningfully convey the reasons why the actual amounts awarded for these forms of compensation were appropriate under the circumstances. Please revise accordingly in future filings. Using information for your most recently completed fiscal year, please show us in your response what your revised disclosure will look like.
8. We note your disclosure on page 39 that the committee established an intended long-term incentive dollar value for each executive officer by considering individual performance among other factors. In future filings, please discuss in more detail the elements of individual performance and contribution that are taken into account when making this determination. Refer to Item 402(b)(2)(vii) of Regulation S-K. Using information for your most recently completed fiscal year, please show us in your response what your revised disclosure will look like.

2010 Payout for FY2008-2010 Performance, page 40

9. In future filings, please discuss in greater detail how you determine the amount of performance shares to award each named executive officer. Refer to Item 402(b)(1)(v) of Regulation S-K. Please disclose how the actual results achieved for each performance goal led to the amount awarded to each named executive officer. Specifically, please disclose how you calculated the payout level of 141% of the target shares. Additionally, please disclose the relationship between this payout level and factors associated with ROCE Spread and EPS Growth. Using information for your most recently completed fiscal year, please show us in your response what your revised disclosure will look like.

FORM 10-Q FOR THE FISCAL PERIOD ENDED DECEMBER 31, 2010

Controls and Procedures, page 26

10. We note that the description of your disclosure controls and procedures in the first sentence of the first paragraph does not conform to the definition of disclosure controls and procedures set forth in Exchange Act Rule 13a-15(e). In future filings, please either describe your disclosure controls and procedures using the full definition of disclosure controls and procedures set forth in the applicable rules, or you may simply omit the description and refer to the applicable rules.
11. We note that the conclusion regarding effectiveness is qualified by the statement “to provide reasonable assurance of the achievement of the objectives described above.” This qualifier is not part of the disclosure controls and procedures definition contained in Exchange Act Rule 13a-15(e) and is not appropriate. In future filings, please revise to provide the conclusion regarding effectiveness based on the full definition of disclosure controls and procedures set forth in the applicable rules. Alternatively, you may simply state that your certifying officers concluded on the applicable date that your disclosure controls and procedures were effective. Finally, please confirm to us that your CEO and CFO concluded that your disclosure controls and procedures were effective based on the full definition of disclosure controls and procedures set forth in the applicable rules.

You may contact Jessica Kane, Staff Attorney, at (202) 551-3235 or, in her absence, Andrew Schoeffler, Staff Attorney, at (202) 551-3748 if you have any questions regarding legal or disclosure matters. Please contact Jeffrey Gordon, Staff Accountant, at (202) 551-3866 or, in his absence, the undersigned at (202) 551-3689 if you have questions regarding comments on the financial statements and related matters.

Sincerely,

John Hartz  
Senior Assistant  
Chief Accountant