



DIVISION OF
CORPORATION FINANCE

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

May 17, 2011

Paul F. McLaughlin
Chairman and Chief Executive Officer
Rudolph Technologies, Inc.
One Rudolph Road, P.O. Box 1000
Flanders, NJ 07836

Re: Rudolph Technologies, Inc.
Form 10-K for the year ended December 31, 2010
Filed February 28, 2011
File No. 0-027965

Dear Mr. McLaughlin:

We have reviewed your filing and have the following 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 amending your filing, 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.

Form 10-K for the year ended December 31, 2010

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations, page 21

Liquidity and Capital Resources, page 24

1. We note from your disclosures on page F-24 that you have not recorded U.S. income taxes on approximately \$1.1 million on foreign subsidiaries' undistributed earnings. It appears as though a portion of your cash balances will not be available for use in the U.S. unless they are repatriated into the U.S. To the extent a significant portion of your cash and cash equivalent balances will not be available in the U.S., please revise future filings to quantify the amount of cash and cash equivalents that are currently held by your foreign subsidiaries. Refer to Item 303(a)(1) of Regulation S-K and Section IV of SEC Release 33-8350.

Reports of Independent Registered Public Accounting Firm, page F-2 and F-3

2. We note that each of the reports of your Independent Registered Public Accounting Firm reference reports dated February 25, 2011. We similarly note that the consent filed as Exhibit 23.1 refers to the reports dated February 25, 2011. However, the reports included here are each dated February 28, 2011. Please amend the filing to provide corrected reports from your Independent Registered Public Accounting Firm together with the entire financial statements and a corrected consent.

Note 6 - Inventories, page F-16

3. We from your disclosure that during 2010 you recorded a recovery of cost of revenues. Please clarify the for us the conditions that led to the recovery and clearly explain how the recovery was recorded in your financial statements. Explain to us how your inventory accounting complies with SAB Topic 5.BB.
4. Further to the above, if material, please also revise management's discussion and analysis of results of operations in future filings to discuss the impact of recoveries of previously written down inventory on your cost of sales and gross profit.

* * * *

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filing to be certain that the filing includes the information the Securities Exchange Act of 1934 and all applicable Exchange Act rules require. Since the company and its management are in possession of all facts relating to a company's disclosure, they are responsible for the accuracy and adequacy of the disclosures they have made.

In responding to our comments, please provide a written statement from the company acknowledging that:

- the company is responsible for the adequacy and accuracy of the disclosure in the filing;
- staff comments or changes to disclosure in response to staff comments do not foreclose the Commission from taking any action with respect to the filing; and
- the company may not assert staff comments as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

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You may contact Eric Atallah, Staff Accountant at (202) 551-3663 or me at (202) 551-3643 if you have questions regarding comments on the financial statements and related matters. In this regard, do not hesitate to contact Martin James, Senior Assistant Chief Accountant at (202)551-3671 with any questions.

Sincerely,

Kevin L. Vaughn
Accounting Branch Chief