



DIVISION OF
CORPORATION FINANCE

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

Mail Stop 3720

December 17, 2009

Via U.S. Mail and facsimile to (413) 778-4817

Mr. Derek Dunaway
President and Chief Executive Officer
Cyalume Technologies Holdings, Inc.
96 Windsor Street
West Springfield, MA 01089

Re: Cyalume Technologies Holdings, Inc.
Form 10-K for the fiscal year ended December 31, 2008
Filed March 30, 2009
File No. 000-52247

Dear Mr. Dunaway:

We have reviewed your filing and have the following comments. Please address the following comments in future filings. If you disagree, we will consider your explanation as to why our comment is inapplicable or a future revision is unnecessary. Please be as detailed as necessary in your explanation. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure. After reviewing this information, we may or may not raise additional comments. You should comply with the remaining comments in future filings, as applicable. Please confirm in writing that you intend to do so within the time frame set forth at the end of this letter.

Please understand that the purpose of our review process is to assist you in your compliance with the applicable disclosure requirements and to enhance the overall disclosure in your filing. We look forward to working with you in these respects. We welcome any questions you may have about our comments or any other aspect of our review. Feel free to call us at the telephone numbers listed at the end of this letter.

Form 10-K for the Fiscal Year ended December 31, 2008

Financial Statements

Reports of Independent Registered Public Accounting Firm, pages F-2 to F-4

1. Please revise the Reports of Independent Registered Public Accounting Firms on pages F-2, F-3 and F-4 to include the City and State where the report was issued, pursuant to Rule 2-02(a) of Regulation S-X.

Item 15. Exhibits and Financial Statement Schedules, page 27

2. Tell us why your three contracts with the United States Department of Defense and N.A.T.O Maintenance and Supply Agency are not filed as material contracts. We note that more than 68% of your total revenues in 2008 were attributable to those agreements. In the alternative, please amend your Form 10-K to file these agreements as exhibits. *See* Item 601(b)(10) of Regulation S-K.

Form 10-Q for the period ended September 30, 2009

Note 6 – Notes Payable, page 11

3. Please expand the disclosure to clarify whether the waivers for compliance as of June 30, 2009 and September 30, 2009 were both included in the Loan Amendment signed September 11, 2009. Also, tell us and expand the disclosure in future filings to include the period covered by the waiver and the terms of the waiver, including whether the lender retained the right to call the debt based on the June 30, 2009 default or the September 30, 2009 default at any time in the future and if so, as of what date.

Definitive Proxy Statement incorporated by reference into Part III of the Form 10-K

Executive Compensation, page 8

4. Your Summary Compensation Table on page 8 shows that you awarded your named executive officers certain bonuses. Further, page 9 shows that certain of your NEOs are eligible to be awarded bonuses, pursuant to their employment agreements, based upon your company performance and reaching certain revenue and EBITDA performance targets. Also, pursuant to your two Current Reports on Form 8-K filed on June 4, 2009 and July 22, 2009, we note that you have amended your employment agreements with certain of your executive officers to provide for cash bonuses and equity awards based upon your company performance and reaching certain revenue and EBITDA performance targets.

In future filings, please quantify all objective performance targets and describe all non-objective performance targets that you use to determine how much compensation to award your NEOs and your level of achievement of these performance targets. Where you use non-objective performance targets, please describe how your NEOs performed with respect to any criteria or factors upon which their performance is evaluated.

* * * *

Please respond to these comments within 10 business days of the date of this letter or tell us when you will provide us with a response. Please furnish a letter that keys your responses to our comments and provides any requested information. Detailed letters greatly facilitate our review. Please file your letter over EDGAR. Please understand that we may have additional comments after reviewing your responses to our comments.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filings reviewed by the staff to be certain that they have provided all information investors require for an informed decision. 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 connection with responding to our comments, please provide, in writing, a statement from the company acknowledging that:

- The company is responsible for the adequacy and accuracy of the disclosure in the filings;
- The staff comments or changes to disclosure in response to staff comments do not foreclose the Commission from taking any action with respect to the filings; 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.

In addition, please be advised that the Division of Enforcement has access to all information you provide to the staff of the Division of Corporation Finance in our review of your filings or in response to our comments on your filings.

Derek Dunaway
President and Chief Executive Officer
Cyalume Technologies Holdings, Inc.
December 17, 2009
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You may contact Claire DeLabar, Staff Accountant, at (202) 551-3349 or Terry French, Accountant Branch Chief, at (202) 551-3828 if you have questions regarding comments on the financial statements and related matters. Please contact Ajay Koduri, Attorney-Adviser, at (202) 551-3310, or me at (202) 551-3810 with any other questions.

Sincerely,

Larry Spiegel
Assistant Director