

BY EDGAR

October 10, 2007

Brian Cascio  
Accounting Branch Chief  
Division of Corporation Finance  
Securities and Exchange Commission  
100 F Street, N.E.  
Washington, DC 20549-6010

Re: Axcelis Technologies, Inc.  
Form 10-K for the fiscal year ended December 31, 2006  
Form 10-Q for the quarterly period ended March 31, 2007  
File No. 000-30941

Dear Mr. Cascio:

The following responds to your letter of August 28, 2007 to the undersigned regarding the Forms 10-K and 10-Q referred to above filed by Axcelis Technologies, Inc. (the "Company").

For convenience, each of your comments is restated below, followed by our response.

Form 10-K for the fiscal year ended December 31, 2006

Consolidated Statements of Operations, page F-2

1. We reference your response to prior comment one in our letter dated July 20, 2007. We note that you do not separately track costs in a format that would enable you to separately report costs of systems, services and royalties. However, we see that services revenue is approximately 40% of total revenue. Under Article 5-03(b) (1) and (2) of Regulation S-X, you should separately state costs and expenses applicable to each category of sales and revenues. To the extent that you are able to estimate the costs applicable to each category of sales presented on the face of the income statement, future filings should be revised to reflect this presentation.
2. As a related matter, we continue to believe that the gross profit for systems and services should be separately discussed in the results of operations section of MD&A.

---

Historically, as previously disclosed in the notes to the financial statements, service revenue included revenues from spare parts, equipment upgrades and maintenance services, collectively, aftermarket revenues. We believe this presentation of revenues was and continues to be meaningful to the readers of our financial statements due to the cyclical nature of system sales and the fact that aftermarket revenues do not fluctuate as much as systems revenues from industry cycle to cycle. However, in order to provide a meaningful classification of costs of goods sold, we will reclassify the system revenue components of amounts historically reported as service revenue. Under this revised classification, system revenue will include revenue from systems sales, sales of spare parts and product upgrades. Service revenue will include revenue received from maintenance and service contracts and service hours provided by on-site service personnel. This reclassification will allow us to allocate direct and shared costs of product and service revenues in a supportable and meaningful manner. As such, we will present in the statement of operations separate amounts for costs of system and service revenues. Reclassification of amounts reported in prior periods will be made to permit comparison. Such reclassifications will not affect total revenues, total gross profit or net income or loss, as previously reported. This reclassification will be disclosed in the notes to our financial statements and we will update the accounting policy with respect to revenue categories.

As mentioned above, we continue to believe that the disclosure of total aftermarket revenues, including spare parts, equipment upgrades and service is important and relevant information to the users of our financial statements. Accordingly, in MD&A section of our quarterly and annual filings, we will supplementally disclose the portion of product revenue that relates to aftermarket activities.

The Company will separately discuss gross profit for products and services in the results of operations section of MD&A in future filings.

Please direct any questions or further comments regarding this letter to me at the above address or contact me directly by telephone at (978) 787-4110 or by email at [Stephen.Bassett@axcelis.com](mailto:Stephen.Bassett@axcelis.com).

Sincerely,

cc: Kristin Lochhead  
Securities and Exchange Commission