

Mail Stop 6010

December 14, 2006

**VIA U.S. MAIL and FACSIMILE (978) 262-8801**

Kenneth J. Galaznik  
American Science and Engineering, Inc.  
Chief Financial Officer  
829 Middlesex Turnpike  
Billerica, Massachusetts 01821

RE: American Science and Engineering, Inc.  
Form 10-K for the fiscal year ended March 31, 2006  
Filed June 9, 2006  
File No. 001-06549

Dear Mr. Galaznik:

We have reviewed your filing and have the following comments. We have limited our review of your filing to those issues we have addressed in our comments. Where indicated, we think you should revise your document in response to these comments. If you disagree, we will consider your explanation as to why our comment is inapplicable or a 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 raise additional comments.

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 March 31, 2006

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations, page 20

2006 Compared to 2005, page 20

1. We see that your net product sales and contract revenues increased 86% in fiscal 2006 compared to fiscal 2005. Additionally, we see that net product sales decreased 50% in the six months ended September 30, 2006 compared to the same prior year period. It appears that the fluctuations in revenues are heavily driven by sales of your Z Backscatter Systems. In your response and in future filings, please discuss the nature of the Z Backscatter Systems that result in variability in revenue. Additionally, in future filings, please disclose how changes in volume or per unit price of the Z Backscatter Systems impacted your revenues. We note that you disclose the number of Systems sold in fiscal 2005, but do not provide similar information for fiscal 2006 or 2007.

Critical Accounting Policies, page 25

Warrant Liability, page 26

2. We note from page 40 that your volatility for determining the value of the warrant liability decreased from 73% at March 31, 2005 to 49% at March 31, 2006. Additionally, we see that volatility was 65% at September 30, 2006. Please revise future filings to discuss the reasons for significant changes in assumptions used to value warrants or other stock based compensation.

Consolidated Financial Statements

Note 2. Lease Agreements, page 45

3. Regarding your accounting for the renovations to your Billerica facility, please tell us and revise future filings to disclose why the lease did not qualify for sale-leaseback treatment once the construction project was complete.

Note 8. Sales of Assets, page 52

4. Tell us why you should not account for the sale of your High Energy Systems Division as discontinued operations. Refer to paragraphs 41-44 of SFAS 144.

As appropriate, please respond to these comments within 10 business days or tell us when you will provide us with a response. Please furnish a cover letter with your response that keys your responses to our comments and provides any requested information. Detailed cover letters greatly facilitate our review. 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 filing to be certain that the filing includes all information required under the Securities Exchange Act of 1934 and 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 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.

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 filing or in response to our comments on your filing.

You may contact Kristin Lochhead at (202) 551-3664 or me at (202) 551-3676 if you have questions. In this regard, please do not hesitate to contact Martin James, Senior Assistant Chief Accountant, at (202) 551-3671 with any other questions.

Sincerely,

Brian Cascio  
Accounting Branch Chief