



May 18, 2009

Brian Cascio, Branch Chief
Division of Corporation Finance
United States Securities and Exchange Commission
100 F Street, N.E.
Washington, D.C. 20549

Re: Amtech Systems, Inc.
Form 10-K for the fiscal year ended September 30, 2008
Filed December 10, 2008
File No. 000-11412

Dear Mr. Cascio:

This letter sets forth the responses of Amtech Systems, Inc. (the "Company") to your comment letter, dated March 31, 2009, relating to (i) the Form 10-K for the fiscal year ended September 30, 2008 of the Company filed with the Securities and Exchange Commission (the "Commission") on December 10, 2008; (ii) the Form 10-Q for the quarter ended December 31, 2008, filed with the commission on February 9, 2009; and (iii) the current report on Form 8-K/A filed with the Commission on November 2, 2007.

The Company is filing, via EDGAR, this letter setting forth the Company's responses to comments of the Staff of the Commission (the "Staff"). Enclosed as well are two hard copies of the Company's response letter. We have included your original questions in addition to providing our responses.

Form 10-K for the fiscal year ended September 30, 2008

Item 1. Business, page 3

1. We note your disclosure on page 4 that in "fiscal 2008, [y]our net revenue" and that [y]our top 10 customers collectively represented approximately 62% of [y]our net revenue:

Additionally, we note your disclosure on page 14 that in "fiscal 2008, 2007 and 2006, one customer accounted for approximately 20%, 13% and 17% of [y]our net revenue, respectively." Please tell us, and in future filings disclose, the name of the customer, which we note "has been different [each year]," and any relationship with that customer, pursuant to the requirements of Regulation S-K Item 101(c)(vii). Please also tell us which customers accounted for the 22% and 20% of total accounts receivable at September 30, 2008.

131 South Clark Dr. Tempe, AZ 85281

Tel: (480) 967-5146 Fax: (480) 968-3763

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- R:** According to Regulation S-K § 229.101(c)(vii) disclosure of the name of the customer and its relationship, if any, is required "if sales to the customer...equal to 10 percent or more of the registrant's consolidated revenues and the loss of such customer would have a material adverse effect on the registrant and subsidiaries taken as a whole." As you have noted, we disclosed that our largest customer has been different in each of the last three years. The ranking of our largest customers, most of whom represent less than 10% of consolidated revenue, varies significantly from year to year. Our products/systems are designed to operate for many years; thus, significant sales to the same customers in consecutive years generally do not occur. Since we do not rely on the same 10% or more customers for recurring revenue of a similar magnitude, we do not believe that the loss of any one of these customers would have a material adverse effect on future operations or the financial condition of the Company. This was borne out in the six months ended March 31, 2009, during which the 20% customer in fiscal 2008 represented 2% of consolidated revenue and ranked 13th based on revenue during the six months ended March 31, 2009. In future filings, we will disclose the names of 10% or more customers if the conditions set forth in the regulations are met.

The registrant had no other relationship with the referenced customers.

Though, for the reasons mentioned above we do not believe disclosure of customer names is material or required, in order to ensure compliance with your request number 1, we are providing that information here. The customers that accounted for approximately 20%, 13%, and 17% of net revenue in fiscal 2008, 2007, and 2006 were Yingli Green Energy Holding Company Ltd. (NYSE: YGE), E-ton Solar Tech. Co., Ltd, and Infineon AG. The customers that accounted for the 22% and 20% of total accounts receivable at September 30, 2008 were Tianwei New Energy Holdings Co. Ltd. and Yingli Green Energy Holding Company Ltd. (NYSE: YGE), respectively.

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Item 11. Executive Compensation

To facilitate your review, we have included text from our proxy, or references to our proxy, in our responses to questions relating to Item 11 of the 10-K for the fiscal year ended September 30, 2008.

Determining Executive Compensation, page 7

2. We note your disclosure that your compensation committee considers “compensation of executives of comparable companies within similar industries” when making salary recommendations for your named executive officers. Since you appear to benchmark compensation, please discuss how each element of compensation relates to the data you analyzed from peer companies and include an analysis of where actual payments actually fell within the targeted parameters. If any of your named executive officers are compensated at levels that are materially different from the targeted levels of compensation, please also provide discussion and analysis as to why. In addition, in your applicable future filings, please identify the peer companies that you use. See Regulations S-K Item 402(b)(2)(xiv).

R: As noted on page 7 of our Proxy Statement, “our Compensation Committee reviews information regarding salaries, including the compensation of comparable companies within similar industries and to make recommendations regarding the salary of our chief executive officer and chief financial officer.” As it relates specifically to base or salary compensation, page 8 of our Proxy Statement states the following: “During fiscal 2008, our chief financial officer, at the request of our Compensation Committee, summarized the base pay for chief executive officers and chief financial officers as reported in the American Electronics Association Salary Survey. Using parameters that best fit our company (for example, revenues, public companies, similarities in numbers of employees, and geographic region), our chief financial officer presented a statistical summary of such information and made recommendations to our Compensation Committee that were in line with the average and median salaries of similarly situated companies.”

The reference to “comparable companies” found on page 7 was in the context of an overall review of compensation and the specific data from the survey discussed on page 8 was the primary data used by the Compensation Committee in determining base compensation for the chief executive officer and chief financial officer. Based on the survey analysis reviewed by the compensation committee, the average of the median base salary for the positions of CEO and CFO was \$280,000 and \$202,000, respectively. The salary approved by the compensation committee for the CEO and CFO was \$275,000 and \$198,000, respectively.

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3. We also note your disclosure here and on page 8 that you rely upon “published and proprietary survey data” when implementing your compensation programs. Please identify the surveys you used and their components; include component companies, the elements of compensation that are benchmarked and how you determine such benchmarks.

R: Page 8 of our Proxy Statement states the following (emphasis added): “During fiscal 2008, our chief financial officer, at the request of our Compensation Committee, summarized the base pay for chief executive officers and chief financial officers as reported in the American Electronics Association Salary Survey. That survey benchmarks base salary, bonus and other unspecified compensation. Since cash incentive compensation for our named executives is calculated under our bonus program based upon quantifiable measures of performance, we limited our use of the survey to base salary. Using parameters that best fit our company (for example, revenues, public companies, similarities in numbers of employees, and geographic region), our chief financial officer presented a statistical summary of such information and made recommendations to our Compensation Committee that were in line with the average of the median salaries of similarly situated companies.”

The survey data did not provide a separate listing of the individual companies included within the data, but was based upon companies that are in or serve the electronics industries, which includes manufacturers of equipment used by semiconductor and solar cell manufacturers. The survey does not include specific data for equity based compensation.

Elements of Our Executive Compensation Program, page 8

4. You state that the compensation committee considers “the roles and responsibilities” and “the individual experience and skills of [y]our executives” when making compensation decisions. Please provide additional disclosure to discuss and analyze how individual performance contributes to actual compensation for named executive officers. For example, disclose the elements of individual performance, both quantitative and qualitative, and specific contributions by named executive officers that the compensation committee considers in its evaluation. If applicable, please also discuss how these elements are weighted and factored into specific compensating decisions. See Regulations S-K 402(b)(2)(vii).

R: **The compensation committee primarily considers the roles, responsibilities, skills and experience of the named executives in establishing base salary.** Our chief executive officer is also one of the founders of the company and has over 30 years of experience in the markets in which we serve. In addition to his CEO role, he effectively serves as our chief sales and marketing officer, and chief strategy officer, although we do not have those specific executive positions. In these roles, our CEO provides leadership in developing the Company’s sales and marketing plans and product acquisition and development strategies. Our chief financial officer is heavily involved in the operations of the company, in addition to his roles in finance, investor relations, SEC reporting, tax planning and compliance, budgeting and forecasting, and serves as a quasi chief operating officer, although we do not have that specific executive position. All three of our executives have experience in equity financings. These qualitative factors are some of the major items considered by the compensation committee in its evaluation.

Quantitative contributions are used primarily in establishing the levels of cash incentive compensation for our names executives. As reflected in our compensation discussion and analysis on page 9 of our Proxy Statement, our bonus program is quantitatively based upon performance objectives established in each of the following categories: (i) bookings; (ii) revenue; (iii) gross margin; and (iv) operating profit.

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Annual Cash Compensation, page 8

5. We note that you increased base salary compensation for your CEO and CFO by approximately 10% and for your chief accounting officer by approximately 15% during fiscal year 2008. Tell us, and expand your disclosure in future filings to explain, what factors you considered in the decision to make these material increases in compensation. See Regulations S-K Item 402(b)(ix).

R: Based on our analysis of the AEA survey, our compensation committee determined that the aforementioned raises were necessary in order to bring our executive compensation in line with that of the industry and ensure we retain our executive talent. Please also see our response to question 4 which further describes the factors considered in the decision to make these material increases in compensation. In future filings we will expand our disclosure with respect to this matter.

Equity Incentive Compensation, page 9

6. We believe that investors will benefit from an expanded analysis of how you arrived at and why you paid each particular level of compensation for 2008. For example, we note minimal discussion and analysis of how you determined specific stock option awards, as disclosed on pages 9 and 10. We would expect to see a more focused discussion that provides substantive analysis and insight into how the Committee made actual payout determinations for the fiscal year for which compensation is being reported. Refer to paragraphs (b)(1)(iii) and (v) of Regulation S-K Item 402. In your response and in future filings, please also clarify the reasons for differences in the relative size of the grants among the officers.

Please understand that discussion of the various items of corporate and individual performance that were considered by you must be accompanied by a complete qualitative and quantitative discussion of how you determined to award each specific form and level of compensation. You should provide complete discussions of specific factors considered by the Committee in ultimately approving this and other forms of compensation, including the reasons why the Committee believed that the amounts paid to each named executive officer are appropriate in light of the various items it considered in making specific compensation decisions.

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R: Please note that the value of stock option awards in fiscal 2008 represent between 7% and 17% of total compensation for our named executives, significantly less than the percent of total compensation represented by base salary or cash incentive compensation. See the Summary Compensation Table on page 11. As disclosed on pages 9 and 10, the committee did not apply a rigid formula in allocating equity incentive compensation to our executives as a group or to any particular executive. Instead, the committee exercised its judgment and discretion and considered qualitatively a number of factors as outlined on page 10. There were no quantitative calculations or measurements performed on the qualitative factors. The primary reason for the differences in the relative size of the grants among the officers is the role and responsibility of the executive and his contribution to the overall success of the company. As described in response to question number 4, we are staffed very leanly at the executive officer level and, as such, our executive officers often have roles that expand well beyond the duties commonly associated with their titles. In future filings we will clarify the reasons for differences in the relative size of the grants among the officers and provide more insight in the determination of the size of equity grants to our executive officers.

Item 13. Certain Relationships and Related Transactions

7. Please provide the disclosure required by Regulation S-K Item 404(b).

R: During the Fiscal 2008 year, we had no transactions that were required to be reported pursuant to Regulation S-K Item 404(a). Regulation S-K Item 404(b) asks for information concerning the review of any transactions required to be reported pursuant to Regulation S-K 404(a). Thus, we believe nothing is required in response to S-K Item 404(b) for Fiscal 2008. Nonetheless, to ensure compliance with your request number 7, below is our policy with respect to related party transactions.

Policy Regarding Related Person Transactions

The policy of the Board is for it, or one of its committees, to review each related person transaction (as defined below) and determine whether it will approve or ratify that transaction. Any Board member who has any interest (actual or perceived) will not be involved in the consideration.

For purposes of the policy, a "related person transaction" is any transaction, arrangement or relationship in which we are a participant, the related person (defined below) had, has or will have a direct or indirect material interest and the aggregate amount involved is expected to exceed \$120,000 in any calendar year. "Related person" includes (a) any person who is or was (at any time during the last fiscal year) an officer, director or nominee for election as a director; (b) any person or group who is a beneficial owner of more than 5% of our voting securities; (c) any immediate family member of a person described in provisions (a) or (b) of this sentence; or (d) any entity in which any of the foregoing persons is employed, is a partner or has a greater than 5% beneficial ownership interest.

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In determining whether a related person transaction will be approved or ratified, the Board, or committee, will consider a multitude of factors including (a) the extent of the related person's interest in the transaction; (b) the availability of other sources of comparable products or services; (c) whether the terms are competitive with terms generally available in similar transactions with persons that are not related persons; (d) the benefit to us; and (e) the aggregate value of the transaction.

Compliance with Section 16(a) of the Securities Exchange Act of 1934, page 20

8. We note your disclosure in the second paragraph under this heading. It appears that you have not disclosed the number of late reports or the number of transactions that were not reported on a timely basis by Messrs. Austin Marx and David Greenhouse. Please tell us, and in future filings include, the number of late reports, the number of transactions that were not reported on a timely basis, and any known failure to file a required form for all Section 16 reporting persons. See Regulations S-K Item 405(a)(2).

R: One of the sentences of our disclosure was inadvertently cut off. Our report should have read as follows:

Based solely on our review of such forms received by us during the fiscal year ended September 30, 2008, or written representations from certain reporting persons, we believe that between October 1, 2006 and September 30, 2008, all Section 16(a) filing requirements applicable to its officers, directors and 10% shareholders were complied with, except that: (i) Messrs. Austin Marx and David Greenhouse appear to have failed to timely file with respect to three (3) transactions; (ii) Mr. Michael Garnreiter failed to timely file with respect to one (1) transaction; (iii) Mr. Alfred Giese failed to timely file with respect to one (1) transaction; (iv) Mr. Brian L. Hoekstra failed to timely file with respect to one (1) transaction; and (v) Mr. Robert F. King failed to timely file with respect to two (2) transactions.

Financial Statements

Note 13. Acquisitions, page 63

9. We refer to the disclosure in Note 13 on page 63 that "the valuation of acquired assets was determined with the assistance of an independent third-party consultant." Please tell us the nature and extent of your reliance on the third party for the asset valuations.
- R:** The independent third-party consultant assisted management in determining the fair value of certain of the intangible assets acquired in the purchase of R2D and in the allocation of the purchase price of that acquisition. The Company's management acknowledges its responsibility for the preparation of purchase price allocations and fair value associated with intangible assets associated with business combinations and asset acquisitions.

Note 10. Business Segments Disclosure, page 57

10. Please tell us how you concluded that the solar and semiconductor equipment products meet the requirements of SFAS 131 to be reported as one segment. In addition, tell us your consideration of providing the product line disclosures outlined in paragraph 37 of SFAS 131.
- R:** Pursuant to paragraph 10 of SFAS 131, an operating segment is a component of an enterprise.....for which discrete financial information is available...and whose operating results are regularly reviewed by the enterprise's chief operating decision maker.... Except for revenue, discrete financial information is not available for our solar or semiconductor equipment products. The only discrete financial information that is separately accumulated and summarized for both solar and semiconductor is revenue. For that reason and a variety of other factors, including the following, we have concluded that solar and semiconductor equipment meets the requirements of SFAS 131 to be reported as one segment:
- Our subsidiaries, Tempress, located in the Netherlands, and R2D, located in France, produce and sell both solar equipment products and semiconductor equipment products. Neither Tempress nor R2D prepare discrete financial information for solar equipment products or semiconductor products, other than revenue, which is reviewed by the Company's chief operating decision maker and certain limited product cost information that is not summarized nor reviewed by that person.

- The Company's solar equipment products and semiconductor equipment products are manufactured, sold and serviced by the same personnel; are comprised of many of the same components; and are based upon the same technologies.
- The only significant distinction between these products is that they are sold into different markets, solar cell fabricators and semiconductor fabricators. As stated above, the only discrete financial information that is available for those markets is revenue.

Paragraph 37 of SFAS 131 states that an enterprise shall report the revenues from external customers for each product and service or each group of similar products and services unless it is impracticable to do so. The Company has two groups of similar products and services: (1) solar and semiconductor equipment; and (2) polishing supplies, which are also the Company's two segments. Revenue for those groups of products are disclosed in Note 10, Business Segment Information on page 57 of the Company's annual report on Form 10-K. As stated above, the only significant distinction between the Company's solar and semiconductor products is the markets they serve. In recent years, sales into the solar market have increased. Therefore, on page 3 in Part I of the Company's annual report on Form 10-K, we disclose solar revenue of \$50.1 million or approximately 62% of total revenue. However, as stated, the solar revenue is that derived from a specific market, not from different products. Therefore, we believe that we have properly identified and disclosed the revenues of the Company's similar groups of products.

Exhibits 31.1 and 31.2

11. We note that you omitted a portion of the introductory language in paragraph 4 of Item 601(b)(31)(i) of Regulation S-K, which refers to internal control over financial reporting. We also note that the certification in Exhibit 31.2 includes two paragraphs 4(c). Finally, we note that the word "condition" was omitted from paragraph 3 of Exhibit 31.1 and was change to "position" in paragraph 3 of Exhibit 31.2. Please file an amendment to the Form 10-K to include corrected certifications. You may file abbreviated amendments to these documents that include a cover page, explanatory note, signature page and paragraphs 1, 2, 4 and 5 of the certification.
- R:** We will file an abbreviated amendment to our Form 10-K for fiscal year 2008, which will include a cover page, explanatory note, signature page and corrected certifications, as Exhibits 31.1 and 31.2, dated as of the dates of the original filing. In Future filings, including any amendments, we will ensure that the wording of the certifications submitted as exhibits 31.1 and 31.2 are exactly the same as that provided at Item 601(b)(31)(i) of Regulation S-K.

Form 10-O for the period ended December 31, 2008

Exhibits 31.1 and 31.2

12. In Future filings, including any amendments, please ensure that the wording of the certification is exactly the same as that provided at Item 601(b)(31)(i) of Regulation S-K. For example, we note that you omitted the parenthetical phrase in paragraph 4(d) and changed the word "condition" to "position" in paragraph 3. In future filings please revise to ensure that the certifications are consistent with the required wording.

R: In future filings, including any amendments, we will ensure that the wording of the certifications submitted as exhibits 31.1 and 31.2 are exactly the same as that provided at Item 601(b)(31)(i) of Regulation S-K.

Form 8-K/A dated November 2, 2007

13. We note the reference in second paragraph of the audit report on page 1 that the audit was conducted in accordance with international auditing standards. Please have your auditors revise their reports to indicate that the audit was conducted in accordance with generally accepted audited standards as required by Article 2 of Regulation S-X.

R: We have been in contact with the independent public accountants that audited the financial statements included in the Form 8-K/A dated November 2, 2007. We have requested them to revise their report to indicate the audit was conducted in accordance with generally accepted auditing standards as required by Article 2 of Regulation S-X. Once we have received their revised report, we will file an abbreviated amendment to our Form 8-K/A, which will include a cover page, explanatory note, signature page and the audited financial statements as Exhibit 99.3, which will include the revised report of the independent public accountants.

14. In the revised audit report, please present the city and country where signed as required by Rule 2-02 of Regulation S-X.

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R: We have also requested the auditor to present the city and country where signed as required by Rule 2-02 of Regulation S-X when submitting the revised report requested pursuant to question 13, above. As stated in response to question 13, once we have received their revised report, we will file an abbreviated amendment to our Form 8-K/A.

15. We note that the form 8-K/A dated November 2, 2007 includes only audited financial statements of R2D. We also note that references in footnote (2) on pages 3 and 4 of Exhibit 99.4 to the financial statements of R2D as of June 30, 2007 "included elsewhere in this Form 8-K/A." Please tell us where you have included the interim financial statements as of June 30, 2007 required by Item 3-05 of Regulation S-X in your 8-K/A filing.

R: The form 8-K/A dated November 2, 2007 includes audited financial statements of R2D, incorporated by reference to Exhibit 99.3 and pro forma financial information incorporated by reference to Exhibit 99.4. The interim financial statements as of June 30, 2007 required by Item 3-05 of Regulation S-X are included on pages 3 and 4 of Exhibit 99.4 to our 8-K/A filing, in the column labeled R2D Ingenierie SAS. Footnote (2) on pages 3 and 4 of Exhibit 99.4 incorrectly refers to both the historical financial statements of R2D Ingenierie SAS as of June 30, 2007 and the audited financial statements of R2D included elsewhere in this Form 8-K/A. Footnote (2) on page 3 should have read, "Represents the historical balance sheet of R2D Ingenierie SAS as of June 30, 2007." Footnote (2) on page 4 should have read, "Represents the unaudited historical statement of operations of R2D Ingenierie SAS for the nine months ended June 30, 2007."

The Company acknowledges that it is responsible for the adequacy of the disclosure in the filings, that 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.

We trust that the foregoing is responsive to your comments. If you have any questions or comments, please contact the undersigned.

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Best regards,
Amtech Systems, Inc.

/s/ Robert T. Hass
Robert T. Hass, CPA
Chief Accounting Officer

CC: Michael Garnreiter, Chairman of the Audit Committee of the Board of Directors
Robert F. King, Chairman of the Compensation and Stock Option Committee of the
Board of Directors
Christopher Johnson, Squire, Sanders & Dempsey L.L.P.
