

September 20, 2007

Mail Stop 6010

Richard Randall
President and Chief Executive Officer
TranS1, Inc.
411 Landmark Drive
Wilmington, NC 28412-6303

**Re: TranS1, Inc.
Amendment No. 1 to Registration Statement on Form S-1
Filed September 4, 2007
File No. 333-144802**

Dear Mr. Randall:

We have reviewed your filing and have the following 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.

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.

Management's Discussion and Analysis..., page 36

Stock-Based Compensation, page 42

1. We note your response to prior comment 15. Please note we are deferring any final evaluation of your stock compensation recognized until the estimated offering price is specified, and we may have further comments in that regard when you file the amendment containing that information.

Business, page 47

Market Opportunity, page 50

2. We note from your response letter and supplemental materials that a Millenium Research Group report cited in your prospectus was prepared at your request and

at your expense. We also note that such report is not publicly available. Please expand your disclosure to include this information. Please also explain whether this report was prepared for purposes of inclusion in this registration statement.

AxiaLIF Clinical Data Summary, page 54

3. We note your response to prior comment 17. Given that you continue to summarize the results of these studies, please file the consents required by Rule 436. Also, it appears that a summary of the Mayfield Clinic study was not included in the supplemental materials you provided. Please provide us with a copy of this study for our review, clearly marked to support the disclosed results.

Compensation Discussion and Analysis, page 71

Role of Compensation Committee, page 71

4. We note your revised disclosure here that the “components of [your] compensation are generally consistent with the compensation components of other comparable medical device companies . . .” Please clarify whether the companies used for this comparison are the same companies disclosed on page 72. Also expand to describe how the components of your program differ from the compensation components of these other companies and explain why you chose to include in your program different compensation components.

Base Salary, page 72

5. We note your response to prior comment 31, in which you state that Mr. Jackson’s salary is double the amount of his predecessor because his predecessor worked on a half-time basis. We also note that your response indicates that Mr. Jackson and his predecessor have comparable salaries. Please expand your disclosure to include this information.

Short-Term Incentive Program, page 73

6. We note your expanded disclosure regarding the 2006 personal and corporate objectives for your executive officers. Please also disclose all 2007 personal and corporate objectives with respect to each of your named executives and the weight assigned to each objective. Please note that even if it is appropriate to omit a goal or objective, your disclosure must include a discussion of how difficult it would be for the executive, or how likely it will be for the registrant to achieve the target levels. See Instruction 4 to Item 402(b). Also, given that Mr. Randall initially recommends all corporate and personal objectives, please describe the extent to which Mr. Randall’s recommendations as to all 2007 objectives were modified by your compensation committee or board of directors.

7. We note that your 2006 corporate objectives were assigned different weights. Please expand to discuss how such weights were determined. For instance, describe whether Mr. Randall initially recommended a weight, which was then approved or modified by your compensation committee or board of directors. Also describe why each objective received the assigned weight. For example, describe whether such weight was based on importance to the company or whether it was based on perceived difficulty to attain. Please provide similar disclosure with respect to your 2007 corporate objectives.
8. We note your disclosure on pages 74 and 75 that Mssrs. Assell, Simmons and Randall received a cash bonus for 2006 based “upon the evaluation of the degree of achievement of the corporate and personal objectives . . .” Please expand to state with specificity the basis for each cash bonus awarded. For example, describe which goals were achieved and which goals were not achieved by each executive officer and by the company. Also describe how the achievement of such goals and the weight assigned to these goals relates to the amounts paid.
9. As a related matter, please disclose the 2007 cash bonus target levels for each of your executive officers. Also disclose whether Mr. Randall’s recommendations as to such target levels were adopted without change, or explain how they differed.

Long-Term Equity-Based Incentive Awards, page 74

10. Please expand your disclosure to identify and describe the specific basis on which you awarded stock options to each of your named executive officers. We note your disclosure here that such awards were “in an effort to retain and continue to provide incentive to the executives,” which does not appear to sufficiently explain the basis for the amounts of these awards.

Review, Approval or Ratification of Transactions with Related Persons, page 84

11. We note your disclosure in response to prior comment 39. Please expand to define a “related party transaction” and a “material transaction” under your policy. Clarify whether your audit committee reviews a related party transaction only when there is the potential for a conflict of interest or whether it reviews all related party transactions that are “material transactions.” Also identify whether any alternative procedures exist in the event a member of your audit committee has an interest in the proposed transaction.

Note 2. Summary of Significant Accounting Policies, page F-7

Revenue Recognition, page F-9

12. Please refer to prior comment 44. We note the revisions made regarding sales to European distributors here and on pages 37 and 42. However, the description on how revenue is recognized for these sales is not consistent. On pages 37 and 42, you state revenue is recognized "upon shipment" whereas your policy here states revenue is recognized "upon delivery". Please revise as appropriate to consistently disclose when you recognize revenue on these sales.

Part II

Item 16. Exhibits, page II-2

13. We note your filing of Exhibit 10.8 in response to prior comment 47. However, it appears that Exhibit C and Exhibit E to this agreement were not included and are not being filed separately as exhibits to this registration statement. Please file these portions of Exhibit 10.8 with your next amendment to this registration statement.

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As appropriate, please amend your registration statement in response to these comments. You may wish to provide us with marked copies of the amendment to expedite our review. Please furnish a cover letter with your amendment 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 amendment and 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 Act of 1933 and that they have provided all information investors require for an informed investment 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 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 connection with our review of your filing or in response to our comments on your filing.

Richard Randall
TranS1, Inc.
September 20, 2007
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We will consider a written request for acceleration of the effective date of the registration statement as confirmation of the fact that those requesting acceleration are aware of their respective responsibilities under the Securities Act of 1933 and the Securities Exchange Act of 1934 as they relate to the proposed public offering of the securities specified in the above registration statement. We will act on the request and, pursuant to delegated authority, grant acceleration of the effective date.

We direct your attention to Rules 460 and 461 regarding requesting acceleration of a registration statement. Please allow adequate time after the filing of any amendment for further review before submitting a request for acceleration. Please provide this request at least two business days in advance of the requested effective date.

You may contact at David Burton at (202) 551-3626 or Kevin Vaughn, Accounting Branch Chief, at (202) 551-3643 if you have questions regarding comments on the financial statements and related matters. Please contact Geoffrey Kruczek at (202) 551-3641 or me at (202) 551-3800 with any other questions.

Sincerely,

Peggy Fisher
Assistant Director

cc (via fax): Bruce Feuchter, Esq.—Stradling Yocca Carlson & Rauth
Michael A. Hedge, Esq.—Stradling Yocca Carlson & Rauth