

August 24, 2006

Via Facsimile (617) 523-1231

Anthony J. Medaglia, Jr., Esq.  
Goodwin Proctor LLP  
Exchange Place  
Boston, Massachusetts 02109  
(617) 570-1000

RE: Mercury Computer Systems, Inc.  
Schedule TO-I filed August 11, 2006  
File No. 005-52823

Dear Mr. Medaglia:

We have the following comments on the above-referenced filing:

Schedule TO-I  
Withdrawal Rights, page 2

1. We note your statement that your "determination of these matter will be final and binding." Please revise this sentence to more precisely define its scope. It appears that your interpretation of the terms of the tender offer may not necessarily be final and binding on all parties. And in the context of conditions, as addressed below, for example, while you may assert an offer condition when it is triggered, when parties contest asserted conditions, the judgments of courts of law are generally considered final and binding in such matters. Please make corresponding revisions throughout your document, including, but not limited to, the last sentence of your section entitled "Conditions of the Tender Offer."

Conditions of the Tender Offer, page 23

2. In the first paragraph you state that you may terminate this offer if one of the listed events occurs and you determine in your reasonable judgment that the occurrence of the event makes it inadvisable to proceed with the offer. You have the right to decide whether to terminate or proceed with your offer if a listed offer condition is "triggered." However, if you go forward with the offer despite the occurrence of one of the listed events, you must waive the applicable condition. Waiver of an offer condition may require extension of the offer and dissemination of additional offer materials. You may not use the language in the first paragraph of this section to tacitly waive an offer condition by failing to assert it. Please confirm your understanding in a supplemental response.

3. We note your first, sixth, eleventh, and fifteenth bulleted offer conditions regarding any event or events occurring that "in [your] reasonable judgment, could materially and adversely affect [your] business, condition (financial or otherwise,) income, operations or prospects. . . ." Please revise to specify or generally describe the prospects to which you refer and clarify what you mean by conditions other than financial, so that security holders will have the ability to objectively determine whether each condition has been triggered.

4. We reference the eleventh bulleted offer condition. Describe what you mean by any change occurring or threatened in your "stock ownership" that is contemplated. Please revise this condition to specify or generally describe what you mean so that security holders will have the ability to objectively determine whether the condition has been triggered.

Forward-looking Statements, page 39

5. Your statement that you undertake "no . . . obligation to update any forward-looking statement to reflect events or circumstances after the date on which such statement is made." appears to be inconsistent with Rule 13e-4(3). Please revise accordingly.

Closing 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. 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;
- \* staff comments or changes to disclosure in response to staff comments in the filings reviewed by the staff 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.

As appropriate, please amend your filing in response to these comments. You may wish to provide us with marked copies of the amendment, if required, to expedite our review. Please furnish a cover letter with your amendment that keys your responses to our comments and provides any requested supplemental information. Detailed cover letters greatly facilitate our review. Please file your response letter on EDGAR. Please understand that we may have additional comments after reviewing your amendment and responses to our comments.

Direct any questions to me at (202) 551-3257. You may also contact me via facsimile at (202) 772-9203. Please send all correspondence to us at the following ZIP code: 20549-3628.

Very truly yours,

Celeste M. Murphy  
Special Counsel  
Office of Mergers &  
Acquisitions