

Mail Stop 0306

April 5, 2005

Via Facsimile and U.S. Mail

Robert E. Hult  
Senior Vice President and Chief Financial Officer  
Mercury Computer Systems, Inc.  
199 Riverneck Road  
Chelmsford, MA 01824

Re: Mercury Computer Systems, Inc.  
Form 10-K for the fiscal year ended June 30, 2004  
Filed September 10, 2004  
Form 10-Q for the quarter ended December 31, 2004  
File No. 0-23599

Dear Mr. Hult:

We have reviewed your response letter dated March 29, 2005 and have the following additional comments. Where indicated, we think you should revise your future filings 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 supplemental information so we may better understand your disclosure. After reviewing this information, we may or may not 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 comment or on any other aspects of our review. Feel free to call us at the telephone numbers listed at the end of this letter.

Form 10-K as of June 30, 2004

Note G - Acquisitions - Page 53

1. We note your response to prior comment 1. We note that you included a discussion of the factors that contributed to a purchase price that resulted in the recognition of goodwill for each of the acquisitions under the headings "Unallocated Purchase Price" for each acquisition in your response dated March 29, 2005. Revise future filings to include these disclosures in your financial statements in accordance with paragraph 51(b) of SFAS No. 141.

Item 9A. Controls and Procedures - Page 68

2. We note your response to prior comment 3. The language that appears after the word "effective" does not appear to include the full definition of disclosure controls and procedures contained in Rule 13a-15(e) of the Exchange Act. Please revise your conclusion to state simply whether your disclosure controls and procedures were

effective. In the alternative, revise to clarify, if true, that your officers concluded that your disclosure controls and procedures were also effective to ensure that information required to be disclosed in the reports that you file or submit under the Exchange Act is accumulated and communicated to your management, including your chief executive officer and chief financial officer, to allow timely decisions regarding required disclosure. Refer to Rule 13a-15(e) of the Exchange Act.

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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 supplemental information. Detailed cover letters greatly facilitate our review. Please file your cover letter on EDGAR. Please understand that we may have additional comments after reviewing your amendment and responses to our comments.

You may contact Kevin Vaughn, Staff Accountant, at (202) 824-5387 or me at (202) 942-2813 if you have questions regarding these comments. In this regard, do not hesitate to contact Martin James, the Senior Assistant Chief Accountant, at (202) 942-1984.

Sincerely,

Daniel Gordon

Branch Chief

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Mr. Robert E. Hult  
Mercury Computer Systems, Inc.  
April 5, 2005  
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