DEPARTMENT OF HEALTH AND HUMAN SERVICES
FOOD AND DRUG ADMINISTRATION

DISTRICT ADDRESS AND PHONE NUMBER	DATE(S) OF INSPECTION
300 River Place, Suite 5900 Detroit, MI 48207 (313) 393-8100 Fax:(313) 393-8139	05/10/2004 - 05/18/2004* FEI NUMBER 1828100

NAME AND TITLE OF INDIVIDUAL TO WHOM REPORT ISSUED

TO: Steven M. Arick, Director of Regulatory Affairs

FIRM NAME	STREET ADDRESS
Terumo Cardiovascular Systems Corp.	6200 Jackson Rd.
CITY, STATE, ZIP CODE, COUNTRY	TYPE ESTABLISHMENT INSPECTED
Ann Arbor, MI 48103-9586	Medical Device Manufacturer

This document lists observations made by the FDA representative(s) during the inspection of your facility. They are inspectional observations, and do not represent a final Agency determination regarding your compliance. If you have an objection regarding an observation, or have implemented, or plan to implement, corrective action in response to an observation, you may discuss the objection or action with the FDA representative(s) during the inspection or submit this information to FDA at the address above. If you have any questions, please contact FDA at the phone number and address above.

The observations noted in this Form FDA-483 are not an exhaustive listing of objectionable conditions. Under the law, your firm is responsible for conducting internal self-audits to identify and correct any and all violations of the quality system requirements.

DURING AN INSPECTION OF YOUR FIRM WE OBSERVED:

MANAGEMENT CONTROLS

OBSERVATION 1

Management with executive responsibility has not ensured that an adequate and effective quality system has been fully implemented and maintained at all levels of the organization.

OBSERVATION 2

Quality audits did not verify that the quality system is effective in fulfilling your quality system objectives.

Specifically, the audit checklist used for interviewing and questioning the auditee is not suitable for conducting audits to assure that the firm's quality system is in compliance with the QSR elements and to determine the effectiveness of the quality system. The checklist is not structured for auditing QSR elements including corrective and preventive action, purchasing, management review, process validation, complaint handling or Product Performance Report (PPR), and others.

OBSERVATION 3

Quality audits were not conducted at sufficient regular intervals, as prescribed by internal procedures to verify that the quality system is effective in fulfilling your quality system objectives.

Specifically, per TCVS 2003 Internal Audit Schedule, audits of the Distribution-Ann Arbor Finished Goods (Audit #03-03) and Calibration (Audit #03-15) areas were scheduled to be conducted by 12/31/03. There is no documentation to show that

DEPARTMENT OF HEALTH AND HUMAN SERVICES
FOOD AND DRUG ADMINISTRATION

DISTRICT ADDRESS AND PHONE NUMBER	DATE(S) OF INSPECTION
300 River Place, Suite 5900 Detroit, MI 48207 (313) 393-8100 Fax:(313) 393-8139	05/10/2004 - 05/18/2004* FEI NUMBER 1828100

NAME AND TITLE OF INDIVIDUAL TO WHOM REPORT ISSUED

TO: Steven M. Arick, Director of Regulatory Affairs

FIRM NAME	STREET ADDRESS
Terumo Cardiovascular Systems Corp.	6200 Jackson Rd.
CITY, STATE, ZIP CODE, COUNTRY	TYPE ESTABLISHMENT INSPECTED
Ann Arbor, MI 48103-9586	Medical Device Manufacturer

the areas were audited as scheduled.

OBSERVATION 4

Not all employees know there is and understand the quality policy.

Specifically, the following production employees were unable to demonstrate that they were familiar with and knew where to obtain the firm's quality policy.

a. [redacted] Temp Expeditor (Central Store)
b. (b)(4) Material Expeditor (Central Store)
c. [redacted] Shipping Clerk

DESIGN CONTROLS

OBSERVATION 5

Unresolved discrepancies were noted at the completion of the design validation.

Specifically, the Quantum Issue Tracker Report Validation Discoveries and Quantum Issue Tracker Report Open Roller Pump Discoveries documents revealed that numerous unresolved, open design discrepancies or issues were not addressed and resolved by the firm at the completion of design validation. The design validation was completed on/about 9/3/02. For example:

a. DISCOV30393 reported "LUI message timing (long & short) sometimes causes confusion."
b. DISCOV30394 reported "Multiple safety connections left over after deleting in config."
c. DISCOV32026 reported "Blood Seepage from Roller Guts."
d. DISCOV28227 reported "Pod Installation Difficulty."
e. DISCOV32027 reported "Oxidation Film on Magnetic Dent Asby."

OBSERVATION 6

Risk analysis is incomplete.

Specifically, the firm's (b)(4) Cardiovascular Systems R&D Lab Standard Operation Procedure, Document No.78-8067-8973-7, Rev.A, requires the use of a Failure Modes and Effect Analysis (FMEA) tool in Phase III on the specific design and/or process. It requires to rate each severity, occurrence, and detection values, as well as , to assess the Risk Priority Number

DEPARTMENT OF HEALTH AND HUMAN SERVICES
FOOD AND DRUG ADMINISTRATION

DISTRICT ADDRESS AND PHONE NUMBER	DATE(S) OF INSPECTION
300 River Place, Suite 5900 Detroit, MI 48207 (313) 393-8100 Fax:(313) 393-8139	05/10/2004 - 05/18/2004* FEI NUMBER 1828100

NAME AND TITLE OF INDIVIDUAL TO WHOM REPORT ISSUED

TO: Steven M. Arick, Director of Regulatory Affairs

FIRM NAME	STREET ADDRESS
Terumo Cardiovascular Systems Corp.	6200 Jackson Rd.
CITY, STATE, ZIP CODE, COUNTRY	TYPE ESTABLISHMENT INSPECTED
Ann Arbor, MI 48103-9586	Medical Device Manufacturer

(RPN). Failure Modes and Effect Analyses were incomplete in that the risk detection value and Risk Priority Number were not determined and assessed per procedure. For example:

a. Quantum Roller Pump Mechanical FMEA
b. Quantum Roller Pump Subsystem FMEA
c. Quantum General Requirements Subsystem FMEA

OBSERVATION 7

Design plans were not approved as needed as the design and development evolved.

Specifically, the Quantum Advanced Perfusion System-1 design plans were not signed and approved. They include:

a. Mechanical Systems Design Plan
b. Manufacturing Development Plan
c. System Integration Design Process Plan
d. Regulatory Plan
e. User Interface (software) Design Process Plan
f. Electronic Hardware Design Process Plan

CORRECTIVE AND PREVENTIVE ACTIONS (CAPA)

OBSERVATION 8

The procedures for implementing corrective and preventive actions were not complete.

Specifically, the firm's Quality Procedure, Corrective and Preventive Action System, Document No.78-8125-6112-0, Rev.B, does not include requirements for:

a. Investigating the cause of nonconformities relating to product, processes, and the quality system;
b. Identifying the action needed to correct and prevent recurrence of nonconforming product and other quality problems;
c. Verifying or validating the corrective and preventive action to ensure that such action is effective and does not adversely affect the finished device; and
d. All activities required under CAPA system is documented.

DEPARTMENT OF HEALTH AND HUMAN SERVICES
FOOD AND DRUG ADMINISTRATION

DISTRICT ADDRESS AND PHONE NUMBER	DATE(S) OF INSPECTION
300 River Place, Suite 5900 Detroit, MI 48207 (313) 393-8100 Fax:(313) 393-8139	05/10/2004 - 05/18/2004* FEI NUMBER 1828100

NAME AND TITLE OF INDIVIDUAL TO WHOM REPORT ISSUED
TO: Steven M. Arick, Director of Regulatory Affairs

FIRM NAME	STREET ADDRESS
Terumo Cardiovascular Systems Corp.	6200 Jackson Rd.
CITY, STATE, ZIP CODE, COUNTRY	TYPE ESTABLISHMENT INSPECTED
Ann Arbor, MI 48103-9586	Medical Device Manufacturer

OBSERVATION 9

Complaint handling procedures have not been implemented to ensure that all complaints are evaluated to determine whether the complaint should be filed as a Medical Device Report.

Specifically, the firm's Medical Device Vigilance Procedure, Document No.78-8067-8512-3, Rev.H, states that "Regulatory Affairs personnel shall assess the product complaint for reportability and document this assessment on QA Specification 78-8067-3732-2, MDR and Vigilance Reporting Decision Record." There is no documentation to show that the following complaints were assessed for MDR reportability. For example:

a. Product Performance Report No.APS064, date reported 10/21/03
b. Product Performance Report No.APS045, date reported 8/29/03
c. Product Performance Report No.APS033, date reported 7/17/03
d. Complaint No.APS039, date reported 8/4/03

In addition, the firm's MDR and Vigilance Reporting Decision Record, Document No.78-8067-3732-2, Rev.N, states that a person qualified to make a medical judgement documents a reasonable conclusion that the Terumo device did not cause or contributed to the death or serious injury. There is no documentation of the medical judgement for Complaint No.11432, dated 12/27/02, which reported "...that after (b)(4) minutes on pump and very soon after putting on the cross clamp, there was an acute occlusion of the venous line resulting in a low level alert and depriming of the (b)(4) cone'." "Patient expired approximately (b)(4) after placing cross-clamp."

OBSERVATION 10

Complaint handling procedures have not been implemented to ensure that all complaints are processed in a uniform and timely manner.

Specifically, 89 of (b)(4) Advanced Perfusion System-1 Product Performance Reports (PPR) which were reported between 1/20/03 to 4/2/04 are still open. The reported complaints have not been processed and closed out in a uniform and timely manner. For example:

a. Product Performance Report No.APS072, date issued 11/21/03, reported "The customer went on bypass and set the FiO2 to [redacted]%." "After cooling the patient, the perfusionist used the CCM to change the FiO2 to (b)(4)%. After a couple of minutes they noticed the arterial blood was very dark and that the FiO2 back to (b)(4)%. This same thing happened again in the case for a total of (b)(4) instances."
b. Product Performance Report No.APS064, date issued 10/21/03, reported that the level in the reservoir dropped below the low level alarm, pump did not pause, air got in the line and air bubble detector stopped the pump.
c. Product Performance Report No.APS045, date issued 8/29/03, reported "System 1 froze up. CCM and all local controls as perfusion was asked to go on pump by surgeon."

SEE REVERSE OF THIS PAGE	DATE ISSUED
	05/18/2004

DEPARTMENT OF HEALTH AND HUMAN SERVICES
FOOD AND DRUG ADMINISTRATION

DISTRICT ADDRESS AND PHONE NUMBER	DATE(S) OF INSPECTION
300 River Place, Suite 5900 Detroit, MI 48207 (313) 393-8100 Fax: (313) 393-8139	05/10/2004 - 05/18/2004* FEI NUMBER 1828100

NAME AND TITLE OF INDIVIDUAL TO WHOM REPORT ISSUED

TO: Steven M. Arick, Director of Regulatory Affairs

FIRM NAME	STREET ADDRESS
Terumo Cardiovascular Systems Corp.	6200 Jackson Rd.
CITY, STATE, ZIP CODE, COUNTRY	TYPE ESTABLISHMENT INSPECTED
Ann Arbor, MI 48103-9586	Medical Device Manufacturer

d. Complaint No.APS040, date issued 8/4/03, reported "Pump jam errors."
e. Product Performance Report No.APS033, date issued 7/17/03, reported "Overspeed/underspeed errors on both arterial and cardioplegia pumps causing pumps to stop pumping."

OBSERVATION 11

Corrective and preventive actions have not been verified or validated to ensure that the action is effective and does not adversely affect the finished device.

Specifically, there is no documentation to show that the corrective actions that have been taken for the following complaints were verified or validated to ensure that the actions were effective and did not adversely affect the finished device.

a. Product Performance Report No.APS033, date issued 7/17/03, reported numerous process corrective actions that were taken to eliminate any possibility of failure for the indicator capacitor of the (b)(4) filter cap NFM61R00T681 at C38 and C41.
b. Product Performance Report No.APS036, date issued 7/21/03, reported a design change to the EPGS panel.

OBSERVATION 12

Not all data from quality data sources are analyzed to identify existing and potential causes of nonconforming product and other quality problems.

Specifically, the firm's Quality Procedure, Corrective and Preventative Action System, Document 78-8125-6112-0, Rev.B, requires an "Analysis of the sources and causes" of Tier 1 CAPA System elements. For example, 7 of (b)(4) trend reports for the Models 8000 & 9000 Heart and Lung Machines did not contain the analysis of the sources and causes of Tier 1 CAPA system elements.

OBSERVATION 13

Complaint handling procedures for receiving, reviewing, and evaluating complaints have not been implemented.

Specifically, the firm's QA Specification Instructions For Conducting A Complaint Investigation, Document No.78-8067-6528-1, Rev.K, requires that the Checklist for Documentation for a Complaint Closure Form is filled out. The firm's QA Specification Complaint Coordinator's Responsibilities For Addressing Product Performance Reports In Ann Arbor, Document No.78-8067-3733-0, Rev.M, states that for complaints, the final documentation file will be prepared including the completed Form 78-8067-6528-1. There is no documentation to show that Final Management Review was conducted and documented on the Complaint Closure Form for the following complaints:

a. Product Performance Report No.APS001, date reported 1/20/03, closed date 5/9/03

DEPARTMENT OF HEALTH AND HUMAN SERVICES
FOOD AND DRUG ADMINISTRATION

DISTRICT ADDRESS AND PHONE NUMBER	DATE(S) OF INSPECTION
300 River Place, Suite 5900 Detroit, MI 48207 (313) 393-8100 Fax:(313) 393-8139	05/10/2004 - 05/18/2004* FEI NUMBER 1828100

NAME AND TITLE OF INDIVIDUAL TO WHOM REPORT ISSUED

TO: Steven M. Arick, Director of Regulatory Affairs

FIRM NAME	STREET ADDRESS
Terumo Cardiovascular Systems Corp.	6200 Jackson Rd.
CITY, STATE, ZIP CODE, COUNTRY	TYPE ESTABLISHMENT INSPECTED
Ann Arbor, MI 48103-9586	Medical Device Manufacturer

b. Product Performance Report No.APS008, date reported 3/4/03, closed date 5/9/03

PRODUCTION AND PROCESS CONTROLS

OBSERVATION 14

A process whose results cannot be fully verified by subsequent inspection and test has not been fully validated and approved according to established procedures.

Specifically, the performance qualification for the USP Purified Water system has not been performed.

OBSERVATION 15

Document control procedures were not implemented.

Specifically, changes to inspection instructions are not performed in accordance with the firm's Production Change Control Procedure, Document No.78-8067-0483-5, Rev.T. For example, the "100% functional test" inspection instruction for the APS1 Assembly Tube Clamp - 6" were changed via a May 10, 2004 email rather than through the Production Change Control Procedure. Prior to the email, the "100% functional test" was performed from verbal instructions and/or a written Product/ Process Evaluation.

OBSERVATION 16

Appropriate procedures have not been defined for controlling environmental conditions.

Specifically, excursions below the operating ranges for temperature (b)(4) degrees F) and relative humidity (b)(4)) in Clean Room 1 are not investigated. The firm could not provide documented justification why investigations are not required.

SEE REVERSE OF THIS PAGE	DATE ISSUED
ICARU	05/18/2004

DEPARTMENT OF HEALTH AND HUMAN SERVICES
FOOD AND DRUG ADMINISTRATION

DISTRICT ADDRESS AND PHONE NUMBER	DATE(S) OF INSPECTION
300 River Place, Suite 5900 Detroit, MI 48207 (313) 393-8100 Fax:(313) 393-8139	05/10/2004 - 05/18/2004*
	FEI NUMBER 1828100

NAME AND TITLE OF INDIVIDUAL TO WHOM REPORT ISSUED
TO: Steven M. Arick, Director of Regulatory Affairs

FIRM NAME	STREET ADDRESS
Terumo Cardiovascular Systems Corp.	6200 Jackson Rd.
CITY, STATE, ZIP CODE, COUNTRY	TYPE ESTABLISHMENT INSPECTED
Ann Arbor, MI 48103-9586	Medical Device Manufacturer

OBSERVATION 17

Certain measuring and test equipment is not suitable for its intended purposes or capable of producing valid results.

Specifically, the following measuring and/or test equipment used in EM production were not calibrated to ensure that they were suitable for its intended purposes and were capable of producing valid results.

a. (b)(4) Safety Monitor (PN 98-0702-0660-6, SN2190, start use date 5/10/95)
b. Dial Caliper, ID #50-0055-01

OBSERVATION 18

Procedures for identifying training needs were not implemented.

Specifically, the firm's Quality Procedure TCVS Ann Arbor Training, Document No.801603, Rev.A, states that, "All new TCVS AA associates (including transfers from other facilities) will receive Quality Orientation training within 2 weeks of their starting date." "The Quality Orientation will include the following topics: TCVS AA quality manual overview; TCVS AA quality system structure; documentation and record keeping responsibilities; and instructions for accessing quality and job related documents." A review of the following EM Product Assembly employee training records revealed that the Quality Orientation training was provided several months after the employees start date.

a. [redacted] Temp (TCVS Quality System Orientation training provided on 4/26/04; start date about 1/04)
b. (b)(4) Temp (TCVS Quality System Orientation training provided on 4/26/04; start date about 1/04)
c. [redacted] Temp (TCVS Quality System Orientation training provided on 4/26/04; hire date 1/26/04)
d. [redacted] Temp Central Store (TCVS Quality System Orientation training provided on 5/10/04; start date about 5/03)

OBSERVATION 19

Procedures for controlling the storage of product in storage areas and stock rooms were not defined to prevent mix-ups, damage, other adverse effects.

Specifically, the firm's Material Control Customer Order Processing procedure, Document No.78-8066-8155-3, Rev.K, does not include provision for adequate control of storage areas and stock rooms to prevent product mix-ups.

* DATES OF INSPECTION:
05/10/2004(Mon), 05/11/2004(Tue), 05/12/2004(Wed), 05/13/2004(Thu), 05/14/2004(Fri), 05/18/2004(Tue)

SEE REVERSE OF THIS PAGE		DATE ISSUED
	1640 MV	05/18/2004

[redacted]

DEPARTMENT OF HEALTH AND HUMAN SERVICES
FOOD AND DRUG ADMINISTRATION

DISTRICT ADDRESS AND PHONE NUMBER	DATE(S) OF INSPECTION
300 River Place, Suite 5900 Detroit, MI 48207 (313) 393-8100 Fax:(313) 393-8139	05/10/2004 - 05/18/2004*
	FEI NUMBER 1828100

NAME AND TITLE OF INDIVIDUAL TO WHOM REPORT ISSUED

TO: Steven M. Arick, Director of Regulatory Affairs

FIRM NAME	STREET ADDRESS
Terumo Cardiovascular Systems Corp.	6200 Jackson Rd.
CITY, STATE, ZIP CODE, COUNTRY	TYPE ESTABLISHMENT INSPECTED
Ann Arbor, MI 48103-9586	Medical Device Manufacturer

FDA EMPLOYEES' NAMES, TITLES, AND SIGNATURES:

Kinh Quoc Mac, Investigator

Art O. Czabaniuk, Investigator

SEE REVERSE OF THIS PAGE

DATE ISSUED
05/18/2004