

DEPARTMENT OF HEALTH AND HUMAN SERVICES

FOOD AND DRUG ADMINISTRATION

DISTRICT ADDRESS AND PHONE NUMBER

300 River Place, Suite 5900
 Detroit, MI 48207
 (313) 393-8100 Fax: (313) 393-8139

DATE(S) OF INSPECTION

06/02/2008 - 08/11/2008*

FEI NUMBER

1828100

NAME AND TITLE OF INDIVIDUAL TO WHOM REPORT ISSUED

TO: Mark A. Sutter, President and Chief Executive Officer

FIRM NAME

Terumo Cardiovascular Systems Corporation

STREET ADDRESS

6200 Jackson Road

CITY, STATE, ZIP CODE, COUNTRY

Ann Arbor, MI 48103-9586

TYPE ESTABLISHMENT INSPECTED

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:

Your firm is a manufacturer of a variety of cardiovascular surgical products which include the following cardiopulmonary bypass devices: bubble detectors, vascular catheters and cannulae, heart-lung machine consoles, temperature controllers, level sensing monitors/controls, nonroller-type and roller-type blood pumps, pump speed controls, and cardiotomy return suckers.

Management Controls Subsystem

OBSERVATION 1

Procedures for conducting quality audits were not established.

For example,

- a. Quality System Procedure (QSP), Quality Systems Audit (Document No. (b) (4) Rev. (b) (4)), provides an overview of internal and external audits. Section (b) (4) of this procedure states that (b) (4) (b) (4) Section (b) (4) states that these (b) (4) Work Instruction (WI), Quality System Internal Auditing (Document No. (b) (4) Rev. (b) (4)), provides instructions for conducting internal quality audits. A review of your firm's 2006 Audit Schedule (approved 4/24/2006) documents that a "(b) (4) (b) (4)" was to be conducted in May 2006. The May 2006 audit was conducted 07/28/2006 - 08/01/2006 by an external auditor to assess compliance to the Japanese Pharmaceutical Affairs Law (PAL), not the Quality System Requirements of 21 CFR 820.
- b. Work Instruction (WI), Quality System Internal Auditing (Document No. (b) (4) Rev. (b) (4)), provides instructions for conducting internal quality audits. Section (b) (4) of this WI states, "(b) (4) (b) (4) This

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procedure is incomplete in that it does not provide instructions on what elements of your firm's quality system are to be audited and how each of the elements is to be audited.

- c. Section (b) (4) of Work Instruction (WI), Quality System Internal Auditing (Document No. (b) (4) Rev. (b) (4)), states that the (b) (4) (b) (4) Your firm has not established a procedure describing how the (b) (4) (b) (4)
- d. Section (b) (4) of Work Instruction (WI), Quality System Internal Auditing (Document No. (b) (4) Rev. (b) (4)) was not implemented in that there is no documentation of an Audit Plan for the 01/03-04/2008 internal audit.

This is a repeat observation from the 08/31/2004 FDA Warning Letter (2004-DT-06).

Design Controls Subsystem

OBSERVATION 2

Procedures were not defined, documented, and completed for the identification, documentation, validation or verification, review, and approval of design changes before their implementation.

Specifically, the following procedures, which govern the control of design changes, are incomplete in that they do not provide clear instructions for handling various levels of design changes. For example:

Quality System Procedure (QSP) - Product Development Process (Document No. (b) (4) Rev. (b) (4)), is the top level document describing your firm's design control requirements for: (1) new product development and (2) substantial product or process modification projects for existing products. This procedure references QSP - Production Change Control (Document No. (b) (4) (b) (4)) for handling design changes to existing products. Section (b) (4) of this procedure describes Phase II (Feasibility) of the design control process and states that for existing product design changes that are required to go through this procedure (based on decision method defined in QSP - Production Change Control, (b) (4)), the Feasibility Phase may be the starting phase.

QSP - Production Change Control (Document No. (b) (4) Rev. (b) (4)), describes the mechanism by which changes to existing processes and specifications are to be proposed, evaluated, approved, and implemented. This procedure does not include the "decision method" referenced in QSP - Product Development Process (Document No. (b) (4) Rev. (b) (4)) and does not include a mechanism/loop back to QSP - Product Development Process (Document No. (b) (4) Rev. (b) (4)) which includes each of the design control requirements of 21 CFR 820.30.

In addition, QSP - Abbreviated Product Development Process (Document No. (b) (4) Rev. (b) (4)) describes your firm's "streamlined" product development process for "line extensions" to existing products.

It is unclear when a design change falls under QSP - Production Change Control (Document No. (b) (4)) versus

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QSP - Abbreviated Product Development Process (Document No. (b) (4)). Moreover, these procedures do not define major ("substantial") versus minor changes and "line extension".

OBSERVATION 3

Procedures for planning and conducting reviews of the design results at appropriate stages of the device's design development were not documented, complete, and implemented.

Specifically, procedure, "Work Instruction (WI) - Design Reviews" (Document No. (b) (4)) Rev. (b) (4) states that the following items should be included in the (b) (4)

(b) (4)

(b) (4)

This procedure was not fully implemented during the following design

projects:

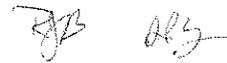
- a. Initial Launch Design - Pediatric Arterial Cannula: A review of the design history file for the initial launch design of the Pediatric Arterial Cannula revealed that design review documentation for two (2) of (b) (4) design reviews conducted during the design project is incomplete in that: the details of the reviews, including the issues and errors raised during the review; and actions, proposed solutions (is any), due dates and person assigned the responsibility for each issue and error raised were not captured in the meeting minutes for the following reviews:
 - i. Design Review (b) (4) dated 02/23/2006
 - ii. Design Review (b) (4) dated 08/09/2006
- b. Re-Launch Design - Pediatric Arterial Cannula: A review of the design history file for the re-launch design of the Pediatric Arterial Cannula revealed that formal documented design reviews were not conducted at appropriate stages of the device's design in that the only documented review was held at the conclusion of the design project ("Final Design Review PAC" on 02/21/2008 and "Action Item Review following 2-21-08 Final Design Review Minutes and Approvals PAC" on 03/03/2008).

OBSERVATION 4

Procedures for validating the device design were not implemented.

Specifically,

- a. Initial Launch - Tender Flow™ Pediatric Arterial Cannula: Protocol, "Qualification of the Terumo Pediatric Arterial Cannula" (Document No. (b) (4) dated 01/27/2006), was not fully implemented. For example, Section (b) (4) of the protocol states that (b) (4). Section (b) (4) of the protocol states that (b) (4). A review of the validation report, (b) (4) (Document No. (b) (4) dated 2/16/2006), documents that pull testing was not performed on the 6 Fr. Pediatric Arterial Cannula (with non-vented connector).

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- b. Initial Launch - Tender Flow™ Pediatric Arterial Cannula: A review of the validation report, "(b) (4)" (No. (b) (4) Rev. (b) (4) dated 09/18/2006) and supporting raw data revealed that the protocol was not fully implemented in that the introducer withdrawal force with the vent cap in place was only performed on (b) (4) introducers, not (b) (4) as required by the protocol.
- c. Re-launch - Tender Flow™ Pediatric Arterial Cannula: A review of the validation protocol, "(b) (4)" (Protocol # (b) (4) Rev (b) (4) Approved 12/11/2007) and validation report, "(b) (4)" (Protocol # (b) (4) Rev (b) (4) Approved 02/28/2008), revealed that the validation protocol was not fully implemented. For example:
- i. (b) (4) populations of 6 Fr. cannula bodies were not measured for overall length as required by the protocol because there were not enough 6 Fr. cannula tube bodies to conduct the validation. In order to conduct the validation, 6 Fr. parts were salvaged from a previous performance qualification. The salvage included cutting the connector off of the cannula body.
 - ii. The population of 16 Fr. cannula bodies used in the validation were not printed and therefore not measured for the location of the first mark.
 - iii. Critical dimensions were not collected on the correct sample size in that the actual number sampled did not follow (b) (4) as required by the protocol.

Bulk Package Configuration	Population (N)	Required Protocol Sample Size (n)	Actual Number Sampled
Package 1 (6 Fr)	(b) (4)	(b) (4)	(b) (4)
Package 2 (16 Fr)	(b) (4)	(b) (4)	(b) (4)
Package 3 (6 Fr)	(b) (4)	(b) (4)	(b) (4)

OBSERVATION 5

Risk analysis is incomplete.

For example,

Re-launch Design - Tender Flow™ Pediatric Arterial Cannula: Section (b) (4) of validation protocol, "(b) (4)" (b) (4) Protocol # (b) (4) Tender Flow™ Pediatric Arterial Cannulae - Cannulae Body" (Rev. (b) (4) Approved 12/11/2007), documents the following: Pediatric Arterial Cannulae bodies are currently manufactured in (b) (4) where they are packaged and shipped via parcel delivery to Ann Arbor, MI and that ship testing of cannulae bodies has not been previously conducted. In addition, section (b) (4) of the protocol states, "(b) (4)" (b) (4) (b) (4) A review of the document, "Tender Flow™ Pediatric Arterial Cannulae Process Failure Modes and Effects Analysis (PFMEA)" (Rev. (b) (4) Approved 02/28/2008), revealed that the process of bulk shipping cannula tube bodies

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was not identified as a potential failure mode.

OBSERVATION 6

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

For example:

Initial Launch Design- Tender Flow™ Pediatric Arterial Cannula: A review of the design verification and validation protocol, "(b) (4)" (No. (b) (4) Rev. (b) (4) dated 03/27/2006) revealed that not all of the acceptance criteria were met at the end of design validation activities. For example, section (b) (4) of the verification and validation protocol specifies the requirements for "(b) (4)". The acceptance criteria specified in section (b) (4) of the protocol states that (b) (4). Section (b) (4) of the (b) (4) (No. (b) (4) Rev. (b) (4) dated 11/14/2006), documents that four (4) out of (b) (4) of the 16 Fr. introducers were greater than the (b) (4) pound sliding force limit. Section (b) (4) (deviation) of the validation report states that the (b) (4).

(b) (4) This deviation was accepted and no additional testing was conducted. There is no documentation that an investigation was conducted to determine the cause of the failures nor is there documented scientific justification for changing this specification limit.

OBSERVATION 7

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

Specifically,

Re-Launch Design- Tender Flow™ Pediatric Arterial Cannula: A review of the re-launch design of the Tender Flow™ Pediatric Arterial Cannula design history file revealed that design verification activities found that several of the critical components of the finished device did not meet specification.

For example, the document dated 03/01/2008 (no title), a retrospective design and development summary for the design changes to the Tender Flow™ Pediatric Arterial Cannula, documents that the design change was planned to be a validation of the bonding process, but during the project, it became evident that much more work would be required to confidently produce product. This document states, "(b) (4)" and that dimensional and cosmetic issues were found.

A review of 100% of incoming acceptance records for four (4) of (b) (4) Tender Flow™ Pediatric Arterial Cannula components (received between 08/30/2007 and 06/27/2008) and the final design review meeting minutes dated 03/03/2008, revealed that component nonconformances were occurring before and after launch of the Tender Flow™ Pediatric Arterial

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Cannula, which launched 03/03/3008. For example:

Stylets

Size	Total Incoming Lots Received	# of Lots That Failed Incoming	% Failure
6 Fr.	(b) (4)	(b) (4)	(b) (4)
8 Fr.			
10 Fr.			
12 Fr.			
14 Fr.			
16 Fr.			
Totals			

Tube Bodies

Size	Total Incoming Lots Received	# of Lots That Failed Incoming	% Failure
6 Fr.	(b) (4)	(b) (4)	(b) (4)
8 Fr.			
10 Fr.			
12 Fr.			
14 Fr.			
16 Fr.			
Totals			

Vent Caps

Size	Total Incoming Lots Received	# of Lots That Failed Incoming	% Failure
0.073	(b) (4)	(b) (4)	(b) (4)
0.091			
Totals			

Connectors

Size	Total Incoming Lots Received	# of Lots That Failed Incoming	% Failure
1/4" w/ luer	(b) (4)	(b) (4)	(b) (4)
1/4" w/o luer			
Totals			

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Corrective and Preventive Actions (CAPA) Subsystem

OBSERVATION 8

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

Specifically,

- a. Work Instruction (WI) - Audit Discrepancy Report Handling (Document No. (b) (4) Rev. (b) (4)), provides instructions for handling audit observations (corrective and preventive actions that come out of internal and external quality audits). This procedure is incomplete in that it does not provide the requirements for:
 - i. Analyzing audit reports to identify existing and potential causes of nonconforming product or other quality problems;
 - ii. Investigating the cause of the non-conforming product or other quality problems;
 - iii. Verifying or validating the corrective and preventive action to ensure that such action does not adversely affect the finished device;
 - iv. Implementing and recording changes in methods and procedures needed to correct and prevent identified quality problems; and
 - v. Ensuring that information related to quality problems or nonconforming product is disseminated to those directly responsible for assuring the quality of such product or the prevention of such problems.
- b. Section (b) (4) of Work Instruction (WI) - Audit Discrepancy Report Handling (Document No. (b) (4) Rev. (b) (4)) describes the documentation requirements for Audit Discrepancy Reports (ADRs) and states that, "(b) (4) (b) (4)". Your firm has not established a procedure designating responsibility maintaining the ADR log and instructions on how to enter information into the database, including instructions for querying and analyzing the quality data within the database. A review of the ADR log from 12/14/2005 through 06/11/2008 revealed that approximately (b) (4) ADRs have been generated since the last FDA inspection.
- c. Audit Discrepancy Report (ADR) (b) (4) was initiated 08/02/2007 regarding several incomplete process validations, including the X-Coating process for the Arterial Cannula. The due date for this corrective action was 05/07/2008. ADR 205 was initiated because the X-Coating process validation was not able to be completed under ADR (b) (4) by 05/07/2008.

The corrective action (X-Coating process validation), identified under ADR (b) (4) was not handled in accordance with Work Instruction (WI) - Audit Discrepancy Report Handling (Document No. (b) (4) Rev. (b) (4)) in that it was not completed within the timeframe required by the ADR (b) (4). In addition, your firm has not established any process control monitoring parameters for the X-Coating process to include temperature and viscosity measurements and X-Coating verification steps. ADR (b) (4) remains open with a due date of 01/30/2009.

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This is a repeat observation from the 08/31/2004 FDA Warning Letter (2004-DT-06).

OBSERVATION 9

Procedures were not followed for the control of products that do not conform to specifications.

Specifically, Work Instruction (WI) – WI – CAPA^{(b) (4)} – Product Nonconformance Report (Document No. ^{(b) (4)} Rev. ^{(b) (4)} provides instructions for documenting and processing nonconformances related to products or processes. A review of approximately 38 of ^{(b) (4)} Nonconformance Reports (NCRs) issued between 08/2007 and 06/2008 for the following Tender Flow™ Pediatric Arterial Cannula components, revealed that Work Instruction (WI) – WI – CAPA^{(b) (4)} – Product Nonconformance Report (Document No. ^{(b) (4)} Rev. ^{(b) (4)} was not always followed. For example, section ^{(b) (4)} of the procedure stated that individual NCRs must be initiated for any items/materials/characteristics that are different in nature, such as cosmetic and dimensions due to Risk Assessment requirements. The following 13 of ^{(b) (4)} NCRs reviewed include more than one nonconforming issue on the same NCR:

Product	NCR	Nonconformances
8 Fr. Stylet	^{(b) (4)}	Flash and melted rod
12 Fr. Stylet	^{(b) (4)}	Flash, particulate, and "bad"
14 Fr. Stylet	^{(b) (4)}	Particulate and foreign material
16 Fr. Stylet	^{(b) (4)}	Flash, pitting, gouging, and dimension
14 Fr. Tube Body	^{(b) (4)}	Dimension and particulate
0.073 Vent Cap	^{(b) (4)}	Particulate and Flash
0.073 Vent Cap	^{(b) (4)}	Particulate and Flash on three different lots
0.091 Vent Cap	^{(b) (4)}	Flash and particulate
0.091 Vent Cap	^{(b) (4)}	Flash and particulate
0.091 Vent Cap	^{(b) (4)}	Flash and particulate
¼" Connector w/ luer	^{(b) (4)}	Flash and loose fibers
¼" Connector w/o luer	^{(b) (4)}	Particulate, cracks, cloudy, scuff marks, and label missing
¼" Connector w/o luer	^{(b) (4)}	Cracks and label missing

In addition, this procedure was not implemented in that on 08/30/2007, lot ^{(b) (4)} 14 Fr. Stylets, quantity ^{(b) (4)} were received and failed incoming inspection because of flash, pitting and a rough tip. A nonconformance report was not initiated in accordance with Work Instruction (WI) – WI – CAPA^{(b) (4)} – Product Nonconformance Report.

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OBSERVATION 10

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

Specifically, the following procedures, which provide instructions for complaint handling do not include instructions for collecting information from the complainant to include the nature and details of the complaint/event in order to evaluate the complaint and determine if it involves a death or serious injury or a device malfunction:

- i. Corporate Procedure – Complaint Reporting (Document No. (b) (4) Rev. (b) (4) establishes the process for Terumo employees to report a customer complaint.
- ii. Corporate Procedure – Complaint Handling Process (Document No. (b) (4) Rev. (b) (4) provides detailed instructions for complaint handling.
- iii. Quality System Procedure, QSP – CAPA (b) (4) – Complaint and Product Performance Report (PPR) Overview (Document No. (b) (4) Rev. (b) (4)
- iv. Work Instruction, WI – CAPA (b) (4) – Complaint and Product Performance Report (PPR) Handling Process (Document No. (b) (4) Rev. (b) (4)

For example, a review of approximately 45 of (b) (4) complaint records revealed at least 11 complaint records do not include documentation of the nature and details of the complaint, including a description of what happened and relevant clinical information (e.g., medical status prior to the event; signs and symptoms; clinical course; treatment; and outcome). The following complaint records are examples:

Complaint #	Date Informed	Product	Complaint Description
CR-(b) (4)	01/22/2008	8000 System Roller Pump	During cardiopulmonary bypass procedure, roller pump would not respond to the stop or reverse buttons
CR-(b) (4)	02/19/2008	8000/9000 Arterial Monitor	During cardiopulmonary bypass procedure, arterial monitor alarmed, and it turned the arterial and cardioplegia pumps off
CR-(b) (4)	12/06/2007	Centrifugal Pump	During cardiopulmonary bypass flow dropped to zero and stayed there even when the motor speed was increased to 3000 rpm
CR-(b) (4)	05/12/2008	APS-1 4" Roller Pump	During cardiopulmonary bypass the pump display/screen went blank

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CR(b) (4)	01/25/2008	APS-1 Platform	During use for cardiopulmonary bypass the level sensor could not be powered on
PPR(b) (4)	04/03/2006	APS-1 Platform	During cardiopulmonary bypass the level sensor erroneously reported that the blood level had fallen below the alert level
PPR(b) (4)	01/20/2006	APS-1 6" Roller Pump	During cardiopulmonary bypass the pump jammed while in the arterial position
CR(b) (4)	11/30/2007	Centrifugal Pump Battery	During cardiopulmonary bypass the pump turned off and did not go to battery. Customer had to hand crank centrifugal pump for approximately 2 minutes*
PPR(b) (4)	01/09/2006	8000 Roller Pump	During cardiopulmonary bypass roller pump would not operate
PPR(b) (4)	07/05/2007	APS-1 4" Roller Pump	During cardiopulmonary bypass pump speed was not accurately displayed
PPR(b) (4)	06/18/2007	APS-1 4" Roller Pump Display	During cardiopulmonary bypass the roller pump display went blank

This is a repeat observation from the 08/31/2004 FDA Warning Letter (2004-DT-06).

Medical Device Reporting (CAPA Satellite)

OBSERVATION 11

An individual medical device manufacturer report submitted per FDA Form 3500A did not contain in Block B a description of the event or problem to include a discussion of how the device was involved, the nature of the problem, and the patient followup or required treatment.

Specifically, a review of approximately 45 of 45 Medical Device Reports (MDRs), revealed that at least 11 MDRs submitted to FDA do not include the required information in Block B, FDA Form 3500A.

For example, the following MDRs were submitted to FDA and do not include a discussion of how the device was involved, including patient follow-up and required treatment/intervention:

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**DEPARTMENT OF HEALTH AND HUMAN SERVICES
FOOD AND DRUG ADMINISTRATION**

DISTRICT ADDRESS AND PHONE NUMBER 300 River Place, Suite 5900 Detroit, MI 48207 (313) 393-8100 Fax: (313) 393-8139	DATE(S) OF INSPECTION 06/02/2008 - 08/11/2008*
	FEI NUMBER 1828100

NAME AND TITLE OF INDIVIDUAL TO WHOM REPORT ISSUED
TO: Mark A. Sutter, President and Chief Executive Officer

FIRM NAME Terumo Cardiovascular Systems Corporation	STREET ADDRESS 6200 Jackson Road
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CITY, STATE, ZIP CODE, COUNTRY Ann Arbor, MI 48103-9586	TYPE ESTABLISHMENT INSPECTED Medical Device Manufacturer
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Compliant #	MDR #	Product	Complaint Description
CR (b) (4)	1828100-2008-00101	8000 System Roller Pump	During cardiopulmonary bypass procedure, roller pump would not respond to the stop or reverse buttons
CR (b) (4)	1828100-2008-00147	8000/9000 Arterial Monitor	During cardiopulmonary bypass procedure, arterial monitor alarmed, and it turned the arterial and cardioplegia pumps off
CR (b) (4)	1828100-2008-00003	Centrifugal Pump	During cardiopulmonary bypass flow dropped to zero and stayed there even when the motor speed was increased to 3000 rpm
CR (b) (4)	1828100-2008-00285	APS-1 4" Roller Pump	During cardiopulmonary bypass the pump display/screen went blank
CR (b) (4)	1828100-2008-00106	APS-1 Platform	During use for cardiopulmonary bypass the level sensor could not be powered on
PPR (b) (4)	1828100-2006-178	APS-1 Platform	During cardiopulmonary bypass the level sensor erroneously reported that the blood level had fallen below the alert level
PPR (b) (4)	1828100-2006-0073	APS-1 6" Roller Pump	During cardiopulmonary bypass the pump jammed while in the arterial position
CR (b) (4)	1828100-2007-00505	Centrifugal Pump Battery	During cardiopulmonary bypass the pump turned off and did not go to battery. Customer had to hand crank centrifugal pump for approximately 2 minutes
PPR (b) (4)	1828100-2006-036	8000 Roller Pump	During cardiopulmonary bypass roller pump would not operate
PPR (b) (4)	1828100-2007-00242	APS-1 4" Roller Pump	During cardiopulmonary bypass pump speed was not accurately displayed
PPR (b) (4)	1828100-2007-00208	APS-1 4" Roller Pump Display	During cardiopulmonary bypass the roller pump display went blank

Production and Process Controls (P&PC) Subsystem

OBSERVATION 12

The device history record does not demonstrate the device is manufactured in accordance with the device master record. Specifically, a random review of 20 of 20 device history records for the following X-Coated cannulae and catheter products revealed that the device history records do not include: (1) the quantity of cannulae that were manufactured with X-Coating at

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Ann Arbor, MI 48103-9586

TYPE ESTABLISHMENT INSPECTED

Medical Device Manufacturer

the X-Coat manufacturing step and (2) the in-process X-Coating acceptance activities performed, including results.

Part No.	Product Name	Lot	Date Mfd.
(b) (4)	Soft Flow Aortic Cannula, Angled Tip, Wire, Luer, 8 mm	0495729	01/08/2008
	Soft Flow Aortic Cannula, Angled Tip, Wire, Luer, 8 mm	0505126	03/20/2008
	Soft Flow Aortic Cannula, Angled Tip, Wire, Luer, 8 mm	0512050	05/20/2008
	Malleable Dual Stage Venous Return Catheter, 34/46 Fr.	0425451	01/12/2006
	Malleable Dual Stage Venous Return Catheter, 34/46 Fr.	0437416	04/25/2006
	Malleable Dual Stage Venous Return Catheter, 34/46 Fr.	0472137	05/01/2007
	Malleable Dual Stage Venous Return Catheter, 34/46 Fr.	0484213	08/21/2007
	Malleable Dual Stage Venous Return Catheter, 34/46 Fr.	0513665	06/03/2008
	Malleable Venous Return Catheter, 28 Fr.	0431637	02/25/2006
	Malleable Venous Return Catheter, 28 Fr.	0455055	11/04/2006
	Malleable Venous Return Catheter, 28 Fr.	0478827	06/25/2007
	Malleable Venous Return Catheter, 28 Fr.	0494878	12/11/2007
	Malleable Venous Return Catheter, 28 Fr.	0502162	02/26/2008
	Dual Stage Venous Return Catheter, 36/46 Fr.	0423485	12/05/2005
	Dual Stage Venous Return Catheter, 36/46 Fr.	0460410	12/16/2006
	Dual Stage Venous Return Catheter, 36/46 Fr.	0485288	09/18/2007
	Extended Soft Flow Aortic Cannula, Luer, 7 mm	0509130	05/29/2008
	Extended Soft Flow Aortic Cannula, Luer, 7 mm	0474987	05/21/2007
	Extended Soft Flow Aortic Cannula, Luer, 7 mm	0493743	11/27/2007
	Extended Soft Flow Aortic Cannula, Luer, 7 mm	0470323	04/11/2007

OBSERVATION 13

Software validation activities for computers or automated data processing systems used as part of the quality system have not been documented.

Specifically, the off-the-shelf software (Microsoft Access) used to document and track Audit Discrepancy Reports (ADRs) has not been verified. A review of the ADR log from 12/15/2005 - 06/11/2008 documents that 100 ADRs have been initiated since the last FDA inspection.

The ADRs include product and process issues. ADR examples include: quality procedures are incomplete; there is no risk assessment for the refurbishment process; corrections and removals not reported to FDA; investigations not properly documented; design history file incomplete for the APS -1; process validations incomplete; and (b) (4) sealing validation incomplete.

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

Document Controls Subsystem

OBSERVATION 14

Records of changes to documents were not maintained.

Specifically, a review of your firm's Audit Discrepancy Log from 12/14/2005 - 06/11/2008 revealed that four (4) Audit Discrepancy Reports (ADRs) were created and later deleted. For example, the "Description" section of ADRs (b) (4) and (b) (4) contain the statement "(b) (4)". The "Description" section of ADR (b) (4) states "(b) (4)". There are no records available that describe what the contents of these ADRs involved or what information was deleted.

The ADRs include product and process issues. ADR examples include: quality procedures are incomplete; there is no risk assessment for the refurbishment process; corrections and removals not reported to FDA; investigations not properly documented; design history file incomplete for the (b) (4) process validations incomplete; and (b) (4) sealing validation incomplete.

OBSERVATION 15

Document control procedures were not implemented.

Specifically,

- a. A review of your firm's Audit Discrepancy Log from 12/14/2005 to 6/11/2008, found that a total of three (3) of (b) (4) ADRs were missing from the log. There is no documentation available regarding these missing ADRs.
- b. Quality System Procedure (QSP) - Production Change Control (Document No. (b) (4) Rev (b) (4), which describes your firm's design change control requirements, references the following obsolete documents:
 - Product Modification Assessment Form, (b) (4) This form was made obsolete in January 2005.
 - Quality Control Procedure (b) (4) This form was made obsolete in May 2008.

Purchasing Controls Subsystem

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Ann Arbor, MI 48103-9586

TYPE ESTABLISHMENT INSPECTED

Medical Device Manufacturer

OBSERVATION 16

There is no clear agreement from the suppliers that they will notify you of changes in the product or service.

Specifically, your firm has not established clear written agreements with the contract manufacturers of your medical devices (including component manufacturers), that they agree to notify you, the manufacturer, of changes in the product or service, so that you may determine whether the changes may affect the quality of the finished device.

For example, your firm has not established clear written agreements with the contract manufacturers of the following components of your finished device, the Tender Flow™ Pediatric Arterial Cannula:

- Cannula tube bodies
- Connectors
- Stylets
- Vent Caps

OBSERVATION 17

Procedures to ensure that all purchased or otherwise received product and services conform to specified requirements were not complete and implemented.

Specifically, the following procedures provide instructions for control of suppliers:

QSP - Supplier Management (Document No (b) (4) Rev. (b) (4) establishes the methods to be used for the management of approved suppliers.

Work Instruction, WI - Supplier Risk Assessment (Document No (b) (4) Rev. (b) (4) provides instructions for performing a supplier risk assessment and developing a supplier risk mitigation plan for high risk suppliers. Section (b) (4) of this procedure defines the following risk scores:

- Low Risk Supplier - Score of (b) (4)
- Medium Risk Supplier - Score of (b) (4)
- High Risk Supplier - Score of (b) (4)

Section (b) (4) of this procedure states that for (b) (4) (b) (4) This procedure does not include a mechanism whereby suppliers are required to be re-evaluated based on current quality data. For example, a review of 100% of incoming acceptance records for four (4) (b) (4) Tender Flow™ Pediatric Arterial Cannula components (received between 08/30/2007 and 06/27/2008) revealed the following:

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TYPE ESTABLISHMENT INSPECTED

Medical Device Manufacturer

Stylets

Size	Total Incoming Lots Received	# of Lots That Failed Incoming	% Failure
6 Fr.	(b) (4)	(b) (4)	(b) (4)
8 Fr.			
10 Fr.			
12 Fr.			
14 Fr.			
16 Fr.			
Totals			

Tube Bodies

Size	Total Incoming Lots Received	# of Lots That Failed Incoming	% Failure
6 Fr.	(b) (4)	(b) (4)	(b) (4)
8 Fr.			
10 Fr.			
12 Fr.			
14 Fr.			
16 Fr.			
Totals			

Vent Caps

Size	Total Incoming Lots Received	# of Lots That Failed Incoming	% Failure
0.073	(b) (4)	(b) (4)	(b) (4)
0.091			
Totals			

Connectors

Size	Total Incoming Lots Received	# of Lots That Failed Incoming	% Failure
1/4" w/ luer	(b) (4)	(b) (4)	(b) (4)
1/4" w/o luer			
Totals			

In addition, the following supplier risk assessments were conducted in 2008. Per WI - Supplier Risk Assessment (Document No. (b) (4) Rev. (b) (4) these suppliers are not required to have a risk assessment performed until 2009:

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Component Supplier of	Risk Assessment Date	Risk Assessment Score
Tube Bodies	03/12/2008	(b) (4) (b) (4) risk
Stylets and Connectors	03/10/2008	(b) (4) (b) (4) risk
Vent Caps	03/04/2008	(b) (4) (b) (4) risk

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Observation Annotations

- | | | | |
|-----------------|-----------------------------------|-----------------|-----------------------------------|
| Observation 1: | Reported corrected, not verified. | Observation 2: | Reported corrected, not verified. |
| Observation 3: | | Observation 4: | Reported corrected, not verified. |
| Observation 5: | Reported corrected, not verified. | Observation 6: | Promise to correct. |
| Observation 7: | Promise to correct. | Observation 8: | Promise to correct. |
| Observation 9: | Promise to correct. | Observation 10: | Reported corrected, not verified. |
| Observation 11: | Reported corrected, not verified. | Observation 12: | Promise to correct. |
| Observation 13: | Promise to correct. | Observation 14: | Promise to correct. |
| Observation 15: | Promise to correct. | Observation 16: | |
| Observation 17: | Reported corrected, not verified. | | |

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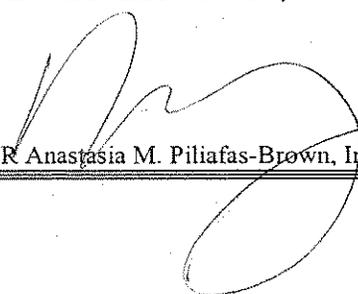
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 06/17/2008(Tue), 06/18/2008(Wed), 06/19/2008(Thu), 06/20/2008(Fri), 06/26/2008(Thu), 06/27/2008(Fri), 06/30/2008(Mon),
 07/01/2008(Tue), 07/03/2008(Thu), 07/09/2008(Wed), 07/10/2008(Thu), 07/11/2008(Fri), 07/15/2008(Tue), 07/16/2008(Wed),
 07/17/2008(Thu), 08/05/2008(Tue), 08/08/2008(Fri), 08/11/2008(Mon)

FDA EMPLOYEES' NAMES, TITLES, AND SIGNATURES:

 LCDR Anastasia M. Piliakas-Brown, Investigator	 Ryan J. Benedict, Investigator
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