

ASL
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PROT. N° 28760

VITERBO, 07/04/2017

A TUTTE LE DITTE INTERESSATE

Oggetto: Indagine di mercato. Servizio di manutenzione ed assistenza tecnica di tipo "full-risk" relativo ad apparecchiature elettromedicali di produzione Siemens per l'Azienda Sanitaria Locale di Viterbo.

Con riferimento al servizio di manutenzione indicato in oggetto, si informa che questa Azienda, con pubblicazione sul sito internet aziendale www.asl.vt.it – intende avviare un'indagine di mercato volta alla conoscenza di operatori tecnici in grado di effettuare il servizio di manutenzione ed assistenza tecnica di tipo "full-risk" relativo all'apparecchiatura elettromedicale Acceleratore Lineare "PRIMUS" di produzione Siemens, con le seguenti modalità:

- ✓ esecuzione delle manutenzioni preventive comprensive dei controlli di sicurezza elettrica secondo le norme CEI e secondo la periodicità e i protocolli indicati nel manuale delle apparecchiature (vedasi check-list allegata);
- ✓ esecuzione, almeno due volte all'anno, del controllo di qualità di ogni singola attrezzatura comprovato da un documento che ne accerti lo standard qualitativo della medesima;
- ✓ esecuzione di tutte le azioni conseguenti a eventuali avvisi di sicurezza e procedure di Field Maintenance Instructions in ambito di sicurezza e/o funzionalità emessi dal produttore;
- ✓ numero illimitato di chiamate per la manutenzione correttiva nonché tutte le operazioni necessarie al ripristino del funzionamento della apparecchiatura e relative componenti, in seguito a segnalazione di malfunzionamenti o rotture avvenute durante il normale utilizzo, esclusi i danni derivanti da incuria e/o uso impropri. Gli interventi di riparazione dovranno avvenire almeno entro le 8 ore lavorative dall'ora di segnalazione del guasto da parte dell'U.O. utilizzatrice dell'apparecchiatura. Il singolo tempo di fermo macchina non potrà superare i 10gg. lavorativi complessivi consecutivi (comprensivi delle manutenzioni preventive, dei controlli di qualità e delle verifiche di sicurezza);
- ✓ dovranno essere previsti interventi su chiamata per assistenza applicativa clinica nella misura di almeno **1 giorno all'anno** per apparecchiatura;
- ✓ fornitura, a titolo gratuito, dell'aggiornamento hardware e software per evitare problemi di obsolescenza, secondo le indicazioni del produttore;
- ✓ ogni necessaria assistenza, compresa la eventuale messa a disposizione di mezzi tecnici necessari, per la esecuzione congiunta con i responsabili della ASL di Viterbo (Servizio di Ingegneria Clinica e Fisica Sanitaria) alle prove di accettazione di cui all'art. 8 del D.Lgs. n. 187/2000 e relativo allegato V;
- ✓ nel corso dell'esecuzione del servizio, deve essere svolto anche un servizio di teleassistenza tramite connessione remota via Wan per l'esecuzione di controllo proattivi, diagnosi remota dei guasti e riparazione di eventuali problemi del software, se prevista dal costruttore;
- ✓ tutti i ricambi saranno inclusi, così come saranno inclusi tutti gli eventuali materiali usurabili (filtri, batterie, lampade, parti non monouso, kit di manutenzione, cavi, eventuale materiale di calibrazione, etc...); le parti di ricambio dovranno essere originali e marchiate CE;
- ✓ sarà inclusa ogni spesa per il personale tecnico dedicato, che dovrà essere qualificato e formato specialisticamente, presso strutture od organizzazioni di formazione riconosciute dal relativo costruttore, per operare sulle apparecchiature oggetto della presente indagine, al fine di garantire la

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- ✓ massima affidabilità ed il mantenimento dei requisiti essenziali per quanto attiene le caratteristiche sicurezza e di prestazione (secondo la direttiva CEE 93/42 e s.m.i);
sarà inclusa ogni spesa per l'aggiornamento al personale utilizzatore a al personale tecnico della ASL Viterbo.

Gli operatori economici in grado di garantire almeno quanto sopra indicato sono invitati a da comunicazione **entro il giorno Venerdì 28 Aprile 2017** a mezzo fax al numero 0761/237 oppure via e.mail agli indirizzi: luca.ronca@asl.vt.it e giorgia.mindel@asl.vt.it

Cordiali Saluti

Il Direttore U.O.C. Ingegneria Clinica
Dott. Ing. Luca Ronca

PRIMUS Linear Accelerator

Maintenance Protocol System

PRIMUS Linear Accelerator Maintenance Protocol

Customer:

Address:

Fax / E-Mail:

Fax / E-Mail:

Department:

Room:

Material-No.:

Serial-No.:

Contract-No.:

Expire date:

Order-No.:

System - ID:

The instructions T2-010.831.03.04.XX are required for this protocol

Evaluating the Condition of the System

The system has no deficiencies. *	<input type="checkbox"/>
The system has slight deficiencies that have no effect on continued operation of the system. The deficiencies should be corrected preventively. *	<input type="checkbox"/>
The system has serious deficiencies. For safety reasons, continued operation of the system is permitted only after successfully correcting the deficiencies.	<input type="checkbox"/>

*) For imaging systems: The result of the image quality check shows no deviation from the reference values.

The evaluation was performed after completing all work steps.	
Signature: _____	
Date: _____	Name: _____

If required by country-specific regulations: The customer or a representative has taken note of the result of the evaluation of the system condition.	
Signature: _____	
Date: _____	Name: _____

Remarks:

Remarks Regarding the Protocol

The chapter numbers refer to the chapters in the instruction, which is referenced on the cover page.

All pages have to have the serial number of the system and the date of maintenance in the page header.

The assignment n.a. (not applicable) indicates that the checkpoint or measured value is not used for this system.

On page 2 the completeness and the results of the maintenance work is confirmed.

Explanation of Abbreviations in the Protocol

Abbreviation	Explanation (OP)	Abbreviation	Explanation (OP)
SI	Safety Inspection	PMF	Preventive Maintenance, Operating Value Check, Function Check
SIE	Electrical Safety Inspection	Q	System Quality, Image Quality
SIM	Mechanical Safety Inspection	QIQ	Image Quality
PM	Preventive Maintenance	QSQ	System Quality Check
PMP	Periodic Preventive Maintenance	SW	Software Maintenance
PMA	Preventive Maintenance Adjustments	CSE	Customer Service Engineer

Measuring Equipment and Measuring Instruments Used

Measuring instruments and measuring devices (phantoms, MR coils, etc.) may not be entered in the table if they have already been entered in the mobile device.

Measuring equipment / instruments	Serial No	Date used

- 1 PRIMUS General
 - 1.1 Scope of Documents
 - 1.1.1 Applicability restrictions
 - 1.1.1.1 Sites with CTVision configuration
 - 1.4 Parts to be replaced during maintenance
 - 1.5 MLC replacement scheme
 - 1.5.1 58 MLC - 3D-MLC / 58 MLC - 3D-MLC with HPC
 - 1.5.2 82 MLC
 - 1.6 OPTIVUE/MVCB
 - 1.8 Abbreviations
 - 1.9 General Hints
 - 1.9.5 "Check all electrical connections ..."
 - 1.10 Grounding

2 Safety Precautions

- 2.1 General
- 2.5 Mechanical damage
- 2.10 SF6 gas
- 2.11 Other risks of injuries

3 3-Month Maintenance

- 3.1 General Information
 - 3.1.1 Required parts
 - 3.1.2 Time estimation
- 3.2 Cleaning & Electrical Connection Checks
 - 3.2.1 M31 Modulator Assembly (if present)
 - PM Cleaned and inspected (if present)
 - 3.2.2 S31 Power Distribution Panel Assembly
 - PM Cleaned and inspected

OK not OK n.a.

3.2.3	S33/S34 Card Cage Assembly			
	PM Cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.4	S35 Magnetron Filament Power Supply (if present)			
	PM Cleaned (if present)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.5	S38 Electromagnetic Terminal Block Assembly (if present)			
	PM Cleaned and inspected (if present)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.6	S41 Current Control Assembly			
	PM Cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.7	S42 Electromagnet Power Supply (if present)			
	PM Cleaned and inspected (if present)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.8	S44 Power Supply (if present)			
	PM Cleaned and inspected (if present)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.9	S45 Rotation Drive			
	PM Drive chain and gearbox inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.10	K1 Power Distribution			
	PM Contactors cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.11	S40A Timer Assembly			
	PM Turn-on timer inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.12	S40B Vacuum Power Supply Assembly			
	PM Cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.13	S40C Chamber High Voltage Power Supply Assembly			
	PM Cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.14	Gantry angle encoder and potentiometer			
	PM Inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.15	S53 Gantry Shaft Encoder Assembly			
	PM Cleaned and Inspected (If present)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.16	Bending Magnet and Klystron Power Supplies Rack			
	PM Cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.17	H33 Accessory Holder (if present)			
	PM Cleaned, inspected, and lubricated (if present)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM Accessories lock securely	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.18	K2 Auxiliary Interlock Chassis Assembly			
	PM Cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.19	K8 Pulse Transformer/Tank Assembly			
	PM Pulse tank cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.2.20	K10 Klystron Area and Solenoid Assemblies			
	PM Cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.21	RF15 Charge System Drawer			
	PM Charge drawer inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.22	SF6 system			
	PM SF6 pressure within range	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.23	Oil Pump Assembly			
	PM Oil pump inspected, no leaks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.24	Cooler Assy			
	PM Cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.25	H31/H43 Primary Collimating System (if present)			
	PM Inspected (if present)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.26	Control Console Cabinet (if installed)			
	PM Inside of CCC cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.27	Control Console			
	PM Cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.28	CC Node			
	PM Cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.29	Control Console Keyboard			
	PM Cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.30	Control Console Monitor			
	PM Cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.31	Older Console versions			
	PM Batteries replaced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4	Electrical Checks			
3.4.1	M31 Modulator Assembly (if present)			
	PM Voltage checked (if present)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4.2	S35 Magnetron Filament Power Supply (if present)			
	PM Operation verified (if present)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4.3	S36 Pump Stand Assembly			
	PM Inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4.4	S37 Bending Magnet Power Supply			
	PM Operation verified (if present)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4.5	K5 Solenoid Power Supplies			
	PM Operation verified (if present)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

OK not OK n.a.

3.4.6	S38 Electromagnet Terminal Block (if present)			
	PM Calibration checked (if present)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4.7	Gantry Bearing Lubrication			
	PM Lubricated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4.8	Bending magnet and klystron power supplies rack			
	PM Power supplies functional	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4.9	S40B Vacuum Power Supply Assembly			
	PM Current and voltage normal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4.10	Control Console Cabinet (if installed)			
	PM Ventilation checked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4.11	Control Console			
	PM All modes and energies in use are operational	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM Keyswitches are intact	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM Current softpots downloaded as backup	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM Parameter sheet is available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM Backup disks are available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM Interlock and error counters cleared	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.5 Multi Leaf Collimator

3.5.1 58 MLC - 30-MLC (if present)

Option present: Yes: No:

Signature: _____

Date: Name:

3.5.1.1	Setup			
3.5.1.2	Leaf calibration			
	PM Leaf calibration verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.5.1.3	Exposure Field Accuracy			
	PM Radiation to light field accuracy verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.5.1.4 External Visual Check

PM Cleaned and inspected

Maintenance of this section was performed by:

Signature: _____

Date: Name:

3.5.2 58 MLC - 3D-MLC with HPC (if present)

Option present: Yes: No:

Signature: _____

Date: Name:

3.5.2.1 Inspection, cleaning, and electrical connection checks

PM Cable connections verified

PM Collimator cleaned and inspected

PM Leaf track cleaned and inspected

3.5.2.2 Electrical Checks

PM Power supply inspected and voltage verified

PM Collimator head power supply inspected and voltage verified

3.5.2.3 Calibration and Functional Checks

PM Radiation to light field accuracy verified

PM Pot linearity verified

PM Calibration and backlash checked

PM X leaf light field range inspected

PM X leaf reproducibility and overtravel checked

3.5.2.4 System verification

PM Covers correctly installed

PMF System tested

SI Warning lights and door interlock tested

3.5.2.5 Completion

Maintenance of this section was performed by:

Signature: _____

Date: Name:

OK not OK n.a.

3.5.3 82 MLC - OPTIFOCUS (if present)

Option present: Yes: No:

Signature: _____

Date: Name:

3.5.3.1 Setup

3.5.3.2 Inspection and cleaning

- PM Cable connections verified
- PM Collimator cleaned and inspected
- PM Leaf track cleaned and inspected

Maintenance of this section was performed by:

Signature: _____

Date: Name:

3.6 BEAMVIEW T1 (if installed)

3.6.1 Mirror

- PM Cleaned and inspected

3.7 OPTIVUE

- PM Check 2D gain calibration
- PM Check 3D MVCB gain calibration, if applicable
- PM Clean brakes with compressed air
- PM Check power cables for wear
- PM Dead pixel map evaluation

3.8 Treatment table

3.8.1 General functions

- PM Tested

3.8.2 Z IV Table

- PM Cleaned and inspected

3.8.3 ZXT - table bearings

- PM Cleaned and inspected

3.8.4 550 TXT - Table bearings

- PM Cleaned and inspected

OK not OK n.a.

3.8.5 Tabletops

3.8.5.1 Acrylic plates, treatment table

PM Inspected (if present)

3.8.5.2 Carbon fiber tabletop

PM Inspected (if present)

3.9 inspection finalization

3.9.1 System verification

PM Covers correctly installed

PMF System tested in Treatment mode

SI Motion Stop override functionality and light indication tested

SI Warning lights and door interlock tested

3.9.2 Completion

Discrepancy Log	No problems	<input type="checkbox"/>	

Maintenance of this section was performed by:

Signature: _____

Date: _____ Name: _____

4 6-Month Maintenance

4.1 General Information

4.1.2 Time estimation

OK not OK n.a.

4.2 Cleaning & Electrical Connection Checks

4.2.1 TEAL Power Conditioner

PM Cleaned and inspected

4.2.2 S36 Pump Stand Assembly

4.2.2.1 Older Pumpstand

PM Cleaned and inspected (if present)

PM Anodes and deionizer cartridge (if present)

4.2.2.2 Lytron Pump Stand

PM Cleaned and inspected (if present)

PM Deionizer cartridge replaced (if present)

4.2.3 G43 beamshield assembly

PM Cleaned, inspected, and lubricated (if present)

PM Lamp replaced (if present)

4.2.4 G53 Counterweight Assembly

PM Cleaned and inspected (if present)

4.2.5 G45 Injector Assembly

PM Cleaned and inspected

4.2.6 Gantry Hub Area

PM Cleaned and inspected

4.2.7 G49 Gantry Power Supply and Interconnect Assembly

PM Cleaned and inspected

4.2.8 G56 +24 V Dosimetry Power Supply

PM Cleaned and inspected

4.2.9 G55 Steering Coil Reversal Assembly

PM Cleaned and inspected

4.2.10 G46 Relay Control Interface Assembly

PM Cleaned and inspected

4.2.11 G47TB1 Lens/Steering Terminals

PM Inspected

4.2.12 G57 Dosimetry Power Supply Assembly

PM Cleaned and inspected

4.2.13 G37 Water Flow PCB Assembly and Flow Sensors

PM Cleaned and inspected

4.2.14 Gantry control

PM Inspected

		OK	not OK	n.a.
4.2.15	Lasers / Patient Setup Devices			
	PM Cleaned and inspected (if part of SIEMENS installation)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2.16	Hand Control Assembly			
	PM Cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2.17	Hand Control Overhead Suspension			
	PM Cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2.18	Oil Cooling System			
	PM Cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM Oil filter replaced (if due)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2.19	H31/H43 primary collimating system & water lines			
	PM Cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3	Electrical Setup			
4.3.1	Emergency-off, -stop and Shunt Trip Push-buttons			
	SIE Emergency Power Off circuits tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4	Electrical Checks			
4.4.1	S41 Current Control Assembly			
	PM Calibration checked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4.2	S35 Magnetron Filament Power Supply			
	PM Operation verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4.3	S45 rotation drive assembly			
	PM Limit switches tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM Drive Chain inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM Gearbox inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4.4	S36 Pump Stand Assembly			
	PM Inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4.5	S35 Magnetron Filament Power Supply			
	PM Operation verified (if present)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4.6	G42 Dosimetry			
	PM Offsets are in range	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4.7	Non-unified G42 assembly			
	PM Inspected (if present)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM Voltage verified (if present)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4.8	K7 RF Driver Assembly (nRFD)			
	PM Operation verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

OK not OK n.a.

4.4.9 Old RF driver

PM Operation verified (if present)

4.4.10 K9 klystron filament power supply

PM Power supply functional (if present)

4.4.11 K2 auxiliary interlock chassis assembly

4.4.11.1 Klystron vacuum

PM Voltage normal (if present)

Measured value:

4.4.11.2 Filament voltage "FIL V"

PM Voltages within range (if present)

Measured value:

Measured value:

Measured value:

4.4.11.3 Filament current "FIL I"

PM Voltages within range (if present)

Measured value:

Measured value:

Measured value:

4.4.11.4 Solenoid current "SOL I"

PM Voltages within range (if present)

Measured value:

Measured value:

Measured value:

Measured value:

Measured value:

Measured value:

Measured value:

Measured value:

Measured value:

Measured value:

Measured value:

Measured value:

4.4.11.5 Core bias

PM Voltage within range (if present)

Measured value:

4.4.12 K2 auxiliary interlock chassis assembly

4.4.12.1 Klystron vacuum

PM Voltage normal (if present)

Measured value:

4.4.12.2 Filament voltage "FIL V"

PM Voltages within range (if present)

Measured value:

Measured value:

Measured value:

OK not OK n.a.

4.4.12.3 Filament current "FIL I"

PM Voltages within range (if present)

Measured value:

Measured value:

Measured value:

4.4.12.4 Solenoid current "SOL I"

PM Voltages within range (if present)

Measured value:

Measured value:

Measured value:

Measured value:

Measured value:

Measured value:

Measured value:

Measured value:

Measured value:

Measured value:

Measured value:

Measured value:

4.4.12.5 Core bias

PM Voltage within range (if present)

Measured value:

4.4.13 K5 solenoid power supplies

PM Power supply functional (if present)

4.4.14 AFC

PM Function tested

PM Pre-positioning adjusted

OK not OK n.a.

4.4.15 G31 Motor control

- PM Inspected
- PM Battery tested (if applicable)

4.4.16 Control Console

- PM All modes and energies in use are operational
- PM Keyswitches are intact
- PM Dose servo tested
- PM Parameter sheet is available
- PM Current softpots downloaded as backup

4.5 Multi Leaf Collimator

4.5.1 58 MLC - 3D-MLC (if present)

4.5.1.1 6-Month Inspection

4.5.1.2 6/12-Month Inspection

4.5.2 58 MLC - 3D-MLC with HPC (if present)

Option present: Yes: No:

Signature: _____

Date: Name:

4.5.2.1 Inspection, cleaning, and electrical connection checks

- PM Labels are intact
- PM Controller cleaned and inspected
- PM Cable connections verified
- PM Fuse operation verified
- PM Battery voltage checked
- PM Mylar film inspected
- PM Collimator mounting bolts inspected
- PM Collimator cleaned and inspected
- PM Leaf track cleaned and inspected

4.5.2.2 Electrical Checks

- PM Power supply inspected and voltage verified
- PM Collimator head power supply inspected and voltage verified
- PM Controller input voltage tested
- PM Controller terminal-to-ground voltage tested
- PM Protective grounding resistance tested

4.5.2.3 Mechanical Checks

- PM Collimator rotation inspected
- PM Digital display of collimator angle verified

OK not
OK OK n.a.

4.5.2.4 Calibration and Functional Checks

PM	Upper jaw aperture and light field verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Radiation to light field accuracy verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Pot linearity verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Calibration and backlash checked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Y jaw light field range inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	X leaf light field range inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Y jaw reproducibility and overtravel checked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	X leaf reproducibility and overtravel checked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4.5.2.5 Motion stop

PM	Motion stop tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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4.5.2.6 Interlock Checks

PM	Interlocks actuated when controller power is turned off	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Interlocks actuated by controller reset status	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4.5.2.7 Inspection finalization

PM	Covers correctly installed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PMF	System tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SI	Warning lights and door interlock tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Maintenance of this section was performed by:

Signature: _____

Date:

Name:

4.5.3 82 MLC - OPT IFOCUS (if present)

Option present: Yes: No:

Signature: _____

Date:

Name:

4.5.3.1 Inspection, cleaning, and electrical connection checks

PM	Labels are intact	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Controller cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Cable connections verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Fuse operation verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Battery voltage checked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Mylar film inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Collimator mounting bolts inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Collimator cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

OK not OK n.a.

	PM	Leaf track cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5.3.2	Electrical Checks				
	PM	Power supply inspected and voltage verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM	Collimator head power supply inspected and voltage verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM	Controller input voltage tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM	Protective grounding resistance tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5.3.3	Mechanical Checks				
	PM	Collimator rotation inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM	Digital display of collimator angle verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5.3.4	Calibration and Functional Checks				
	PM	Upper jaw aperture and light field verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM	Radiation to light field accuracy verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM	Pot linearity verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM	Calibration and backlash checked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM	Y jaw light field range inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM	X leaf light field range inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM	Y jaw reproducibility and overtravel checked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM	X leaf reproducibility and overtravel checked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5.3.5	Motion stop				
	PM	Motion stop tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5.3.6	Interlock Checks				
	PM	Interlocks actuated when controller power is turned off	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM	Interlocks actuated by controller reset status	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5.3.7	Inspection finalization				
	PM	Covers correctly installed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PMF	System tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	SI	Warning lights and door interlock tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Maintenance of this section was performed by:

Signature: _____

Date: _____ Name: _____

4.6 OPTIVUE

PM	Inspect MCVB Geometry Cal Phantom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Inspect MCVB Image Quality Phantom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Bearing Alignment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Alignment correction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

OK not
OK OK n.a.

- PM MVCB Geometry Calibration, if applicable
 PM All ATP Image Quality Checks, if applicable

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4.7 Table maintenance

4.8 Treatment table

4.8.1 Functional test

- PM Tested

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

4.8.2 ZIV treatment table

- PM Cleaned, inspected, and lubricated (if present)

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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4.8.3 550 TXT - Table Maintenance

- PM Cleaned and inspected

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

4.8.3.1 CF memory card

- PM Replaced (if due)

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

4.8.4 ZXT - table maintenance

- PM inspected

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

4.9 Protective Earth (PE) Ground

- SIE PE ground tested

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

4.10 Inspection finalization

4.10.1 System verification

- PM Covers correctly installed
 PM System tested in Treatment mode
 SI Motion Stop override functionality and light indication tested
 SI Warning lights and door interlock tested

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4.10.2 Completion

Discrepancy Log	No problems	<input type="checkbox"/>

Maintenance of this section was performed by:

Signature: _____

Date: _____ Name: _____

4.11 Interlock Checks

4.11.1 Interlocks #15 and #24 -- Mode (SW) and Mode (HW)

PM Tested

4.11.2 Interlocks #21 and #22 -- HI Rate 1 and HI Rate 2

PM Tested

4.11.3 Interlock #36 -- Chamber High Voltage

PM Tested

4.11.4 Interlock #37 -- Gantry Limit Switch

PM Tested

4.11.5 Interlock #39 -- Motion Stop

PM Tested

4.11.6 Interlock #42 -- Water Flow

PM Tested

4.11.7 Interlock #47 -- Bending Magnet (HW)

PM Tested

4.11.8 Interlocks #7 and #8 -- Flatness and Symmetry

PM Tested

OK not OK n.a.

4.11.9	Interlock #53 -- Monitor Sync (HW)			
	PM Tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.11.10	Interlock #54 -- Dose Rate 2 (HW)			
	PM Tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.11.11	Interlock #55 -- Interlock Circuits			
	PM Tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.11.12	Interlock #94 -- pre-high rate			
	PM Tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.11.13	Interlock #98 -- Dose Simulation			
	PM Tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5 9-Month Maintenance

5.1 General Information

5.2 Cleaning & Electrical Connection

5.2.1 Accessory Holder

5.2.1.1 H33 Accessory Holder

PM Cleaned and inspected

5.2.2 H32/H40 Lower Defining Head

PM Cleaned, inspected, and lubricated (if present)

5.2.3 Primary Collimating System

PM Cleaned and inspected (if due)

PM Mode switches inspected (if due)

PM Target area inspected (if applicable)

5.2.3.1 Field Light

PM Bulb replaced

PM Mirror cleaned

5.2.3.2 G41 Assembly

PM Cleaned and inspected

5.2.3.3 G52 Interconnect Assembly and Chambers

PM Cleaned and inspected

5.2.3.4 Lead shielding

PM Inspected

5.2.3.5 Collimator rotation

PM Collimator rotation range tested

PM Collimator play tested

OK not OK n.a.

5.3 Electrical Checks and Adjustment

5.3.1 Collimator Encoder

PM Angle adjusted

5.3.2 G42 Temperature and Pressure Compensation

PM Inspected

PMA Adjustment performed (if required)

5.3.3 ODI

PM Calibration verified

PM Tested for mechanical tightness

5.4 Multi Leaf Collimator

5.4.1 58 MLC - 3D-MLC (if present)

5.4.2 58 MLC - 3D-MLC with HPC (if present)

Option present: Yes: No:

Signature: _____

Date: _____ Name: _____

5.4.2.1 Inspection, cleaning, and electrical connection checks

PM Cable connections verified

PM Collimator cleaned and inspected

PM Leaf track cleaned and inspected

5.4.2.2 Electrical Checks

PM Power supply inspected and voltage verified

PM Collimator head power supply inspected and voltage verified

5.4.2.3 Calibration and Functional Checks

PM Radiation to light field accuracy verified

PM Pot linearity verified

PM Calibration and backlash checked

PM X leaf light field range inspected

PM X leaf reproducibility and overtravel checked

5.4.2.4 Inspection finalization

PM Covers correctly installed

PMF System tested

OK not OK n.a.

SI Warning lights and door interlock tested

Maintenance of this section was performed by:

Signature: _____

Date: Name:

5.4.3 82 MLC - OPTIFOCUS (if present)

Option present: Yes: No:

Signature: _____

Date: Name:

5.4.3.1 Inspection, cleaning, and electrical connection checks

PM	Cable connections verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Collimator cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Leaf track cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5.4.3.2 Electrical Checks

PM	Power supply inspected and voltage verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Collimator head power supply inspected and voltage verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5.4.3.3 Calibration and Functional Checks

PM	Radiation to light field accuracy verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Pot linearity verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Calibration and backlash checked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	X leaf light field range inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	X leaf reproducibility and overtravel checked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5.4.3.4 Inspection finalization

PM	Covers correctly installed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PMF	System tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SI	Warning lights and door interlock tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Maintenance of this section was performed by:

Signature: _____

Date: Name:

5.5	Treatment table			
5.5.1	Functional test			
	PM Tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5.2	ZXT - table bearings			
	PM Cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5.3	550 TXT Table Maintenance			
	PM Cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5.4	Tabletops			
5.5.4.1	Acrylic plates, treatment table			
	PM Inspected (if present)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5.4.2	Carbon fiber tabletop			
	PM Inspected (if present)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.6	Inspection finalization			
5.6.1	System verification			
	PM Covers correctly installed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM System tested in Treatment mode	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	SI Motion Stop override functionality and light indication tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	SI Warning lights and door interlock tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5.6.2 Completion

Discrepancy Log	No problems	<input type="checkbox"/>

Maintenance of this section was performed by:

Signature: _____

Date: _____ Name: _____

6 12-Month Maintenance

6.1 General Information

6.2 Cleaning & electrical connection checks

6.2.1 Non-Lytron Pumpstand

PM Cleaned and inspected
 PM Cartridge changed (if present)

6.2.2 S36 Pump Stand Assembly

PM Water filter replaced
 PM Deionizer replaced

6.2.3 K1 Power Distribution

PM Cleaned and inspected

6.2.4 G39 AFC Assembly

PM Cleaned and inspected

6.2.5 G38 Ion Pump Assembly

PM Cleaned and inspected

6.2.6 G31/G32 Card Cage Assembly

PM Cleaned and inspected

		OK	not OK	n.a.
6.2.7	G41 assembly			
	PM Cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2.8	G42 assembly			
	PM Cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2.9	G52 chamber interconnect assembly			
	PM Cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2.10	Gantry control			
	PM Inspected, contactor replaced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2.11	Oil Pump Assembly			
	PM Inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3	Electrical checks			
6.3.1	S36 Pump Stand Assembly			
	PM Inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3.2	S45 Rotation Drive Assembly			
	PM Limit switches tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM Chain and torque limiter inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3.3	Accessories, E-Applicators and Wedges			
	PM Accessories labeling is correct	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM Accessories without damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3.4	G40 Frontpointer and Rangefinder Assembly (58 MLC and 82 MLC)			
	PM Cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM Lamps replaced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3.5	G42 Dosimetry			
	PM Offsets are in range	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3.6	G40 Frontpointer and Rangefinder Assembly (58 MLC and 82 MLC)			
	PM Calibration verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3.7	Mechanical Frontpointer (if applicable)			
	PM Calibration checked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3.8	G31 Motor control			
	PM Inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM Battery tested (if applicable)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3.9	Injector Gun Filament Voltage (Schottky Plot)			
	PM Gun filament voltage is correct	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PM Gun filament voltage is stable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3.10	H33 Accessory Holder			
	PM Accessory codes are recognized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

OK not OK n.a.

- PM Accessory insertion tested
- 6.3.11 H31 Primary Collimating System
 - PM Tested
- 6.3.12 Control Console
 - PM All modes and energies in use are operational
 - PM Keyswitches are intact
 - PM Dose offsets are in range
 - PM Dose servo tested
 - PM Parameter sheet is available
 - PM Current softpots downloaded as backup

6.4 Multi Leaf Collimator

6.4.1 58 MLC - 3D-MLC (if present)

Option present: Yes: No:

Signature: _____

Date: Name:

- 6.4.1.1 Setup
- 6.4.1.2 6/12-Month Inspection
- 6.4.1.3 Cable Connection
 - PM Cable connections verified
- 6.4.1.4 MLC Rotation
 - PM MLC rotation checked
- 6.4.1.5 MLC Controller
 - PM Controller cleaned and inspected
- 6.4.1.6 MLC Mounting Bolts
 - PM Collimator mounting bolts inspected
- 6.4.1.7 Annual (12-month) Inspection
- 6.4.1.8 Check Batteries
 - PM Battery voltage checked
- 6.4.1.9 Leaf Track Cleaning
 - PM Leaf track cleaned and inspected
- 6.4.1.10 PROM and RAM Replacement
 - PM PROMs and RAMs replaced
- 6.4.1.11 Y Jaw Reproducibility & Overtravel
 - PM Y Jaw reproducibility & overtravel checked

OK not OK n.a.

6.4.1.12 X Leaf Reproducibility & Overtravel

PM X leaf reproducibility & overtravel checked

Maintenance of this section was performed by:

Signature: _____

Date: Name:

6.4.2 58 MLC - 3D-MLC with HPC (if present)

Option present: Yes: No:

Signature: _____

Date: Name:

6.4.2.1 12-Month Maintenance

6.4.2.2 Inspection, cleaning, and electrical connection checks

PM	Labels are intact	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Controller cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Cable connections verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Fuse operation verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Battery voltage checked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Mylar film inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Collimator mounting bolts inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Collimator cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Leaf track cleaned and inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6.4.2.3 Electrical Checks

PM	Power supply inspected and voltage verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Collimator head power supply inspected and voltage verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Controller input voltage tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Controller terminal-to-ground voltage tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Protective grounding resistance tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6.4.2.4 Mechanical Checks

PM	Collimator rotation inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Collimator rotation center is accurate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Gantry rotation center is accurate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Digital display of collimator angle verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6.4.2.5 Calibration and Functional Checks

PM	Upper jaw aperture and light field verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Radiation to light field accuracy verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

OK not OK n.a.

- PM Pot linearity verified
- PM Calibration and backlash checked
- PM Y jaw light field range inspected
- PM X leaf light field range inspected
- PM Y jaw reproducibility and overtravel checked
- PM X leaf reproducibility and overtravel checked
- PM Motion stop tested
- PM Interlocks actuated when controller power is turned off
- PM Interlocks actuated by controller reset status

6.4.2.6 Part Replacement

- PM EPROMs and SRAMs replaced

6.4.2.7 Inspection finalization

- PM Covers correctly installed
- PMF System tested
- SI Warning lights and door interlock tested

Maintenance of this section was performed by:

Signature: _____

Date: _____ Name: _____

6.4.3 82 MLC - OPTIFOCUS (if present)

Option present: Yes: No:

Signature: _____

Date: _____ Name: _____

6.4.3.1 Inspection, cleaning, and electrical connection checks

- PM Labels are intact
- PM Controller cleaned and inspected
- PM Cable connections verified
- PM Fuse operation verified
- PM Battery voltage checked
- PM Mylar film inspected
- PM Collimator mounting bolts inspected
- PM Collimator cleaned and inspected
- PM Leaf track cleaned and inspected

6.4.3.2 Electrical checks

- PM Power supply inspected and voltage verified

OK not OK n.a.

PM	Collimator head power supply inspected and voltage verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Controller input voltage tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Protective grounding resistance tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6.4.3.3 Mechanical Checks

PM	Collimator rotation inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Collimator rotation center is accurate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Gantry rotation center is accurate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Digital display of collimator angle verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6.4.3.4 Calibration and Functional Checks

PM	Upper jaw aperture and light field verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Radiation to light field accuracy verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Pot linearity verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Calibration and backlash checked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Y jaw light field range inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	X leaf light field range inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Leaf speed inspected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Y jaw reproducibility and overtravel checked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	X leaf reproducibility and overtravel checked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Motion stop tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Interlocks actuated when controller power is turned off	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Interlocks actuated by controller reset status	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6.4.3.5 Part Replacement

PM	EPROMs and SRAMs replaced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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6.4.3.6 Inspection finalization

PM	Covers correctly installed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PMF	System tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SI	Warning lights and door interlock tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Maintenance of this section was performed by:

Signature: _____

Date: _____ Name: _____

6.5 OPTIVUE

6.5.1 12 Month

PM	Check vertical ball screw belts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Lubricate ball screws	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Lubricate all 6 grease nipples	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PM	Lubricate longitudinal bearing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

OK not OK n.a.

- PM Inspect collision bumpers, if applicable
- PM Inspect the window shade

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6.5.2 36 Month

- PM Replace vertical ball screw belts
- PM Replace the Perkin Elmer power cable and trigger cables

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6.5.3 48 Month

- PM Replace Lambda Power Supply

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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6.6 Treatment table

6.6.1 ZXT treatment table

- PM Cleaned and inspected
- PM Free movement verified

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6.6.2 ZXT base plate checks

6.6.2.1 Wheel track wear

- PM Cleaned and inspected

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

6.6.2.2 Wheel parallelism check

- PM Checked

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

6.6.2.3 Float switch check

- PM Float switch checked

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

6.6.3 550 TxT Table Maintenance

- PM Cleaned, inspected, and lubricated
- PM Float switch tested
- PM Inspect vertical push chain mounting

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6.6.4 550 TxT Vertical Brakes

- PM Inspected

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

6.6.5 Carbon Fiber Tabletop

- PM Inspected

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

6.6.6 General functions

- PM Tested

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

6.7 Protective Earth (PE) Ground

- SIE PE ground tested

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

6.8 Inspection finalization

6.8.1 System verification

- PM Covers correctly installed
- PM System tested in Treatment mode
- SI Motion Stop override functionality and light indication tested

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

OK not OK n.a.

SI Warning lights and door interlock tested

6.8.2 Completion

Discrepancy Log	No problems	<input type="checkbox"/>	

Maintenance of this section was performed by:

Signature: _____

Date:

Name:

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