

# DePaul

Medical Center

150 Kingsley Lane  
Norfolk, Virginia 23505  
Telephone (804) 889-5000  
Fax No. (804) 423-3148

November 23, 1992

U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Attention: Document Control Desk

**Subject:** NRC License #45-00986-02  
Safety Concerns on EOUSL of Theratronics Teletherapy Units

To Whom It May Concern:

This letter is in response to the NRC bulletin 92-02 regarding the "Safety Concerns Relating to "End of Life" of Aging Theratronics Teletherapy Units." The following information addresses the reporting requirements in the bulletin, and outlines how DePaul Medical Center will address the "end-of-useful life" issue and the maintenance and servicing concerns related to Theratronics Int'l Ltd. withdrawal of support for our Co-60 teletherapy unit. Below is a list of the information requested:

1. Co-60 Teletherapy Unit: AECL Theratron 80  
Model #: TH-80, S/N: 332  
  
AECL Co-60 Source  
Model #: T-80, S/N: S-4120
2. The Co-60 Unit was installed at DePaul Medical Center in January 1972. This Co-60 teletherapy unit was manufactured in 1971. The last Co-60 source change was performed on May 5, 1988 and the 5 year inspection was done at that time.
3. Serial No. #: 332
4. The present uses of the teletherapy Co-60 unit are: routine clinical use for patient treatment, instrument calibration and as a backup for the linear accelerator
  - a. The Co-60 unit treats on average: 10-15 patients/day or 50-75 patients/week.
  - b. If the Co-60 unit is down for an extended time, patients would be treated on the linear accelerator.



Member of DAUGHTER INTERNATIONAL HEALTH SYSTEM

9212090124 921123  
PDR ADOCK 03007515  
C PDR

TE12 11

5. This Co-60 unit has a steel arm. We have contracted Bob Johnson, AECL, who verified this. Theratronics has revised the Survey and Inspection Procedures to Rev. D. these procedures will be reviewed and followed. This will be done on an annual basis.
6. See attached service record.
7. The Co-60 teletherapy unit has no service contract. NRC has approved our in-house bio-medical engineer personnel to perform service on the Co-60 teletherapy unit. (See correspondence on June 14, 1989 for Amendment #11, regarding the approval of in-house service). Service arrangements between authorized service vendors are made on a "service on demand" basis.
8. Inspections on the Co-60 unit:
  - a. "Five (5) year inspections" performed by a licensed service engineer every 5 years, or when unit is moved or whenever the source is replaced.

PMI every 2 years by the manufacturer. Last PMI was done on February 11, 1992 by NPI and in-house service. On an annual basis, the physicist does a yearly calibration, mechanical check and safety and interlock check of the operation of the Co-60 unit as well as a visual inspection of the unit. Also annually an inspection will be performed following the Survey and Inspection Procedures, Rev. D as outlined by Theratronics.

Monthly spot checks are also performed by the physicist as detailed in 10-CFR 35.634. DePaul is committed to continue to subscribe to these regulations (see attached sheets).

Operational checks are performed before each day of use by the radiation technologist. They are committed to follow our current daily Q.A. inspections.
  - b. Service of the Co-60 unit. Service is provided by the NRC approved in-house engineer. Other services provided from an outside vendor arranged on as "as required" basis. The outside vendor is Neutron Products, Inc. These services require a licensed individual as required by the conditions of our license.
  - c. Part replacement for the Co-60 unit. Necessary parts would be obtained through NPI, AECL or a local vendor. The suitability of any part would be discussed in detail with either NPI, AECL, or the licensed person providing service to our Co-60 unit. Parts purchased commercially will be equal to or better than the original part.
  - d. Service: Service is provided by our approved in-house engineer. Services requiring a licensed individual will be provided by a vendor that has a valid NRC or Agreement State license to service our unit. Currently, we have used Neutron Products, Inc. (NPI) Maryland, license #MD 31-02503.

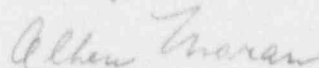
There is discussion regarding the replacement of the Co-60 teletherapy unit. The cost of the annual fee and the cost of compliance has made it difficult and not feasible to continue operating the Co-60 unit. These additional health care expenses have added a burden, to consider alternatives. Decisions would be made prior to the 5 year inspection or source exchange time.

- e. DePaul Medical Center is committed to abide by the NRC regulations. Any needed repairs or inspections will be done accordingly. The Co-60 unit will not be used until all necessary repairs and/or inspections have been completed. The RSC and The RSO will oversee the use and service of the Co-60 unit. They will determine when use should be suspended and when the unit should be retired from service.

Operators and in-house service personnel are instructed to inform the RSO/RSC if any unusual changes in the Co-60 unit.

Please feel free to contact us with any questions concerning the above information.

Sincerely,



Allen Moran  
Vice President, Ancillary Services

cc: U.S. Nuclear Regulatory Commission  
Office of Nuclear Material Safety & Safeguards  
101 Marietta Street, N.W.  
Atlanta, GA 30323

**SERVICE RECORD FOR COBALT-60 TELETHERAPY UNIT  
AT DEPAUL MEDICAL CENTER**

The service record for the AECL Theratron 80 Unit at DePaul Medical Center for the past 5-years is recorded below:

1988:

March 18:	Two screws broke off on the trimmers. Replaced screws. New collimator to be installed in June.	1 hr
May 5:	Co-60 Source change, teletherapy unit inspection and service performed by AECL.	1 day
May 10:	Treatment table failure (longitudinal lock). Restored brake configuration to original configuration.	1 hr
May 12:	Field light fuse repeatedly blows. Reassembled field light assembly.	5 hrs
Nov. 1:	Source did not return to position smoothly. Problem noted.	---
Nov. 3:	Replaced SPI light bulb.	.5 hr
Nov. 11:	Replaced rotation light bulb.	.5 hr
Dec. 2:	Table not locking properly. Lubed and cleaned brake disk.	1 hr
Dec. 7:	Rotation lock on table not working properly, and reset button on console burnt out. Cleaned and adj. rotational lock, replace bulb.	1 hr
Dec. 15:	Trimmer piece broke off, weld broken on support bar. Replaced trimmer part.	1.5 hrs

1989:

Jan 13:	Lateral table movement sticking. Readjusted thrust bearings.	1 hr
Jan 19:	Collimator jaws not in sync with adjusting knobs. Reset screws on holding knob.	.5 hr
Jan 20:	Source indicator bar missing from head of Co-60 unit. Replaced at collimator change.	4 hrs
Feb 28:	Replaced bulb on beam on indicator (red light).	.5 hr

March 10:	Timer popped and lights blew out. Bad battery connection.	--
March 30:	Field light flickering. Loose connection between switch and bracket.	1 hr
April 5:	Field size noncongruence. Adjusted field size, physicist's annual inspection.	.5 hr
April 26:	ODI has 0.5 cm error. Adjusted ODI, physicist's annual inspection.	.5 hr
May 10:	Retightened bulb for beam off indicator (green light).	
May 16:	Replaced SPI lamp.	.5 hr
May 26:	Gantry motion stopped while manually rotating gantry. AECL advised but could not consistently reproduce.	1 hr
May 30:	Install collimator, install Varitimer (back-up timer) and replace position indicator rod by AECL.	1 day
June 2:	Longitudinal table movement sticking. Could not reproduce.	
June 12:	Field light not working. Reattached connector between switch and light assemble.	.5 hr
June 13:	Field light not working. Loose connection again.	1 hr
June 21:	Hand pendant fell off. Replaced and re-enforced pendant and cable.	.5 hr
July 26:	Retightened bulb for beam off indicator (green light).	.5 hr
Aug 3:	Field light flickering on and off. Retightened connection to switch.	1 hr
Aug 11:	Reseated bulb for beam off indicator (green light).	.5 hr
Aug 23:	Timer will not reset. Reseated battery boards and cleaned connections.	.5 hr
Aug 30:	Red indicator light bulb replaced.	.5 hr
Sept 5:	Green indicator light bulb replaced.	
Sept 19:	Trimmer loose. Disassembled and cleaned, reassembled.	2 hrs

Sept 26:	Cobalt compressor running alot. Noted, see Theratron SR.	-
Oct 5:	Longitudinal couch movement trips collision buzzer. Repaired.	1 hr
Oct 9:	Gantry rotation trips collision switch.	-
Oct 30:	Timer will not reset. Cut power and removed battery to reset.	.5 hr
Nov 15:	Timer will not turn on. Loose battery terminal, retightened. Green indicator light bulb replaced.	.5 hr .5 hr
Dec 4:	Compresso. runs, trimmers sticky, cross wires off. Noted.	-
Dec. 13:	Refitted connector for field light in head.	.5 hr
 <u>1990:</u>		
Feb 14:	Replaced negator tapes for source movement and adjusted collimator cross-hairs (AECL).	1 day
March 7:	Retightened loose connection for green indicator light.	.5 hr
March 15:	During gantry rotation, strange sound of something loose.	-
March 22:	Backup, timer not consistent. Static discharge, see Theratron SR.	--
May 8:	Hand pendant broken. Repaired and retightened	.5 hr
June 12:	Replaced bulb for reset button on console.	1 hr
June 13:	Semi-annual PMI, adjusted light field and ODI (AECL).	5.5 hrs
July 5:	Replaced compressor (AECL).	-
Sept 7:	Trimmers tightened.	1 hr
Nov 29:	Light field intensity flickering, trimmer loose. Reconnected loose plug and tightened trimmer screws.	.5 hr
Dec 27:	Retighted trimmers.	-



1991:

Jan 15:	Trimmer sticky, table noisy when lowering or raising. Cleaned and readjusted trimmers and table.	1.5 hrs
May 9:	Collimator symmetry off, readjusted.	
Aug 30:	Cleaned contacts on field light, flickering.	.5 hr
Sept 10:	Timer broken. Adjusted pot on timer, repaired.	
Sept 26:	Field light flickering. Cleaned and adjusted rails, rails may need to be replaced.	
Oct 29:	Lube trimmers and adjusted ODI.	

1992:

Feb 11:	Replaced light tapes, checked collimator axis, performed PMI (NPI).	1 day
June 15:	Treatment couch cuts off in up and down motion. Cleaned relays and tested system, could not get to fail.	3.5 hr
Sept 9:	Replaced green ir licator light bulb.	