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Heartland Cancer Treatment Center

Mr. Roy J. Caniano, Chief
Nuclear Materials Safety, Section 2
United States Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

October 11,1990

24-13246-02

Dear Mr. Caniano,

This correspondence refers to the Notice of Violations which resulted from a routine inspection on August 22, 1990, by Ms. E. R. Matson.

1. The first violation concerns the verification of dose prescription and calculations by the dosimetrist or physicist before treatment is administered to the patient.

Our policy of verifying dose prescriptions and calculations has been amended to comply with the standards included in our license, i.e., all calculations are checked prior to a patient starting treatment. Patients are not allowed to be treated unless the radiation therapist sees that the dose prescription has been verified. The memo of policy change is enclosed.

2. The second violation cited relates to record maintenance of the annual staff refresher training done during 1989. It should be noted that the annual refresher course was conducted in 1989, but that there was inadequate documentation of this course and its content. Our 1990 refresher training will be done on October 16, 1990. The content of this course will be documented and the course will be conducted during the fall of each year. A memo to staff concerning this training, a signature sheet and an outline of the course content is enclosed.

3. The leak test record form and our procedures have been modified to include the serial number of the cobalt-60 source, its estimated activity, its model number, the measured activity of each test sample expressed in microcuries, and the signature of the radiation safety officer. This modified form is also enclosed.

4. The fourth violation referred to the determination of beam uniformity test at useful orientations of the beam. Beam uniformity tests were done before the cobalt unit was used in 1988. These tests were in the form of dose profiles at various depths using a water phantom and ion chamber scanner. We overlooked showing these results to Ms. Matson on her site visit. New beam uniformity tests were done on August 29,1990.

The results of the August 29, 1990, uniformity test were sent to Ms. Matson and a copy of these are enclosed.

501 Robidoux Street • St. Joseph, Missouri 64501 • 816-271-7280
A subsidiary of Heartland Health System

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Thank you for bringing these violations to our attention. We have carefully reviewed the guidelines of our NRC Cobalt license no. 13246-02. We believe that we are in full compliance with these regulations and will continue to maintain strict adherence to these procedures in the future.

Respectfully,

License No. 24-13246-02

Docket No. 030-30121

Colville E. Osborne, MS, Physicist

HEARTLAND CANCER TREATMENT CENTER
St. Joseph, Missouri

Policy No. 502

CALCULATIONS

Colville Osborne, Physicist — DATE

William Russell, Cancer Program Manager — 10/1/90 DATE

POLICY STATEMENT:

1. Calculations will be performed on all new patients and patients under treatment whose treatment set-up has been significantly modified. Simple calculations may be performed by the radiation therapists; however, all calculations will be checked by a dosimetrist or physicist.

2. All calculations will be independently checked and verified, either by recalculation or comparison with programmable calculator results before radiation treatment begins.

3. Whenever possible computer calculations will be manually verified.

4. Results of all calculations, together with the date of calculation, will be recorded in the appropriate sections of the patient's chart. All calculations will be initialed by the person who performed them.

CALCU1.PPS
1/15/90 Revised
10/1/90 Revised

HEARTLAND CANCER TREATMENT CENTER

TO: All Staff

FROM: Colville Osborne
Physicist

DATE: October 10, 1990

RE: ANNUAL RADIATION SAFETY REFRESHER COURSE

Our annual refresher training program in Radiation Safety in the Radiation Therapy environment will be held in the Conference Room on Tuesday 16th October at 11:00 am. All Staff must attend.

Thank You.

HEARTLAND HOSPITAL WEST
CANCER TREATMENT CENTER

PERSONNEL TRAINING PROGRAM
Signature Sheet

I, _____ verify that the following topics were covered
(name)

adequately and understood during _____ the annual
(duration)

refresher training program conducted on _____.
(date)

	TOPICS	SIGNATURE
a.	License conditions	_____
b.	Handling emergencies (drills)	_____
c.	Radioactive storage areas	_____
d.	Radiation hazards	_____
e.	Radiation safety concepts and procedures	_____
f.	Pertinent NRC regulations	_____
g.	Staff reporting obligations	_____
h.	Personnel exposure notification and test results	_____
i.	Location of NRC's rules, regulations and license conditions	_____

Course conducted by _____

Signature _____

* Each participant will be given a copy of NUREG-0267 "Principles and Practices for Keeping Occupational Radiation Exposures at Medical Institutions As Low As Reasonably Achievable" Pgs 29-39.

HEARTLAND CANCER TREATMENT CENTER
St. Joseph,Missouri Policy No.

LEAK TEST PROCEDURE FOR
(a) Cesium-137 brachytherapy sources
(b) Cobalt-60 teletherapy source.

Colville Osborne, Physicist 10·12·90 DATE

William Russell, Director of Radiology DATE

GENERAL:

(1) A Scintillation counter sufficiently sensitive to detect 0.005 microcurie is used.

(2) A standard check source of the same isotope as the wipe samples is used to estimate the detection efficiency of the scintillation counter.

(3) An integrating survey meter is kept in the vicinity of the sources being leak tested to monitor personnel radiation exposure.

(a) CESIUM-137 BRACHYTHERAPY SOURCES

(4) Four or five sources are placed in a suitable solvent and gently stirred. Use the longest pair of tongs possible (more than 8 inches) to hold the container. The sources are then removed and the activity of the solvent is measured in a scintillation counter.

(5) If any leak sample's activity is greater than 0.005 microcurie then each source is individually leak tested as in (4) to determine the defective source.

(6) The Radiation Safety Officer is then notified and the source is withdrawn from use to be repaired of discarded. The NRC is notified.

(b) COBALT-60 TELETHERAPY SOURCE

(7) Cotton swabs moistened with a suitable solvent are used to wipe the following areas,

(i) Fixed collimator bars (nearest the source).
(ii) Collimator leaves
(iii) Trimmer bars (furthest from the source).

(8) The wipe is taken with the source in the `off` position,taking care not to touch the field light,mirror,or crosshairs.

(9) The activity of the samples is determined using the appropriate scintillation counter and standard check source (see (1) and (2)).

(10) If the activity of the wipe sample is greater than 0.005 microcuries, the cobalt unit is withdrawn from use and the R.S.O., source manufacturer, and the NRC are notified.

HEARTLAND HOSPITAL WEST

CANCER TREATMENT CENTER

COBALT LEAK TEST REPORT

Date: ..... Cobalt Unit .....

Source Model No. ..... Source Ser. No. .....

Source's Estimated Activity on ..... is .....
(date)

Calibrated Check Source ..... Serial No. .....

Activity .....

Scintillation Counter ..... Location ..... Ser. No.....

TEST SAMPLE	MEASURED (Counts/min.)	MEASURED ACTIVITY (microCuries)
(1) Standard Source		
(2) Background		
(3) Trimmer Bars		
(4) Collimator leaves		
(5) Fixed Collimator Blocks		

REMARKS .Expected.counts.for.a..0.005.microCurie.is.....
.....

PHYSICIST ..... R.S.O. .....

HEARTLAND HOSPITAL WEST
CANCER TREATMENT CENTER

REPORT OF UNIFORMITY TEST ON COBALT-60 TELETHERAPY UNIT

Manufacturer: Theratronics (AECL) Ltd. Model: Phoenix

Units S/N: P10 Source S/N: S-4074 (1.5 cm diam)

Location: Heartland Cancer Treatment Center

Date: 8/29/90

Introduction:

Two methods were used in the determination of beam uniformity. In method 1, a 0.6 cc ionization chamber was used to record central ray, axial and transverse readings in air. In method 2, an optical densitometer and Kodak ready-pack verification (X-OMAT-V) film was used to determine optical densities at the central ray, axial, transverse and also at points in other directions in the same plane. Method 2 is preferred.

Method 1:

A 30x30 cm field size was set at 80 cm SSD. The ion chamber and CO-60 build-up cap was placed in air 80 cm from the source. Readings were taken at the central axis, axially and transverse at 80% of the field dimensions. The results are shown below for gantry angles 180°, 360°, 270°, 90°. The percentages shown are percentages of this central axis reading which is taken to be 100%.

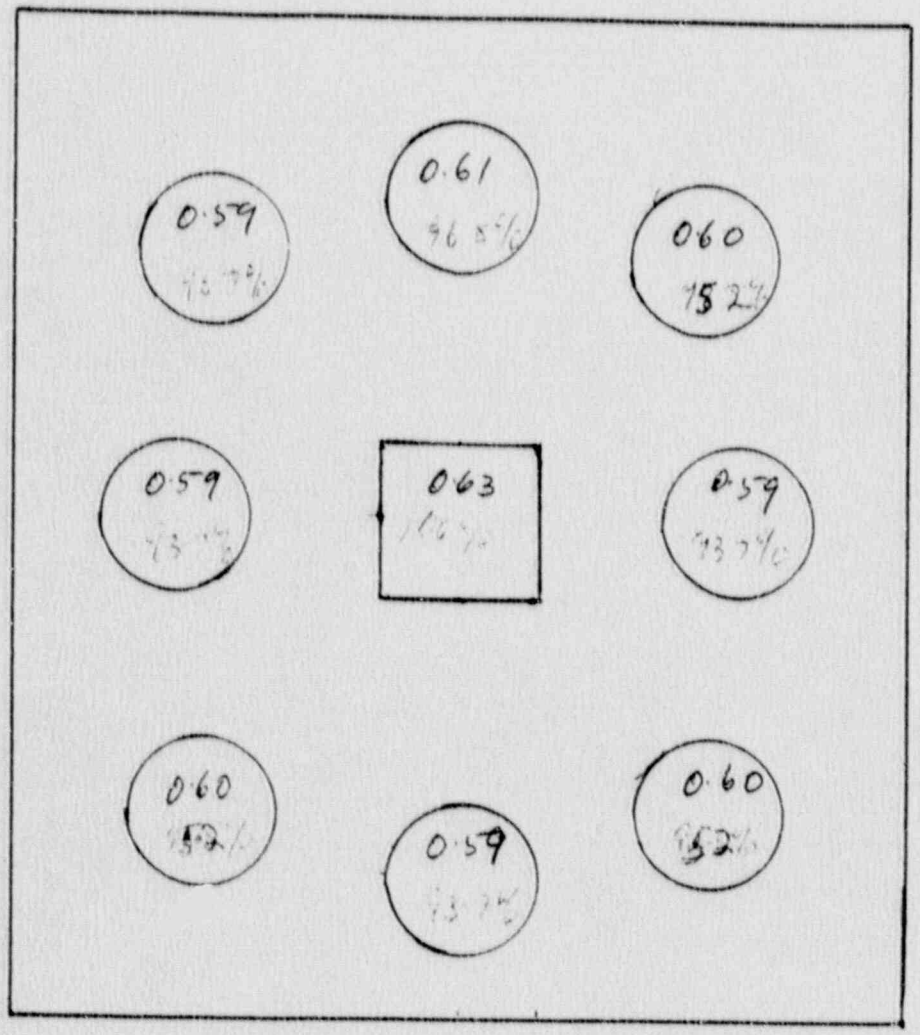
Method 2:

A field size of 23(w) x 25(l) is set up at 80 cm SSD. Kodak ready-pack verification film was placed at 80 cm from the source and exposed. Films were developed under identical conditions and optical density readings were taken at the central axis, at axial and transverse points and at points between axial and transverse directions, i.e. at 45° to axial and transverse lines. The results are shown below for gantry angles of 180°, 360°, 270°, 90°. The percentages shown are percentages of the central axis reading which is taken to be 100%.

UNIFORMITY CHECK - FILM

GANTRY ANGLE: 180°

Axial

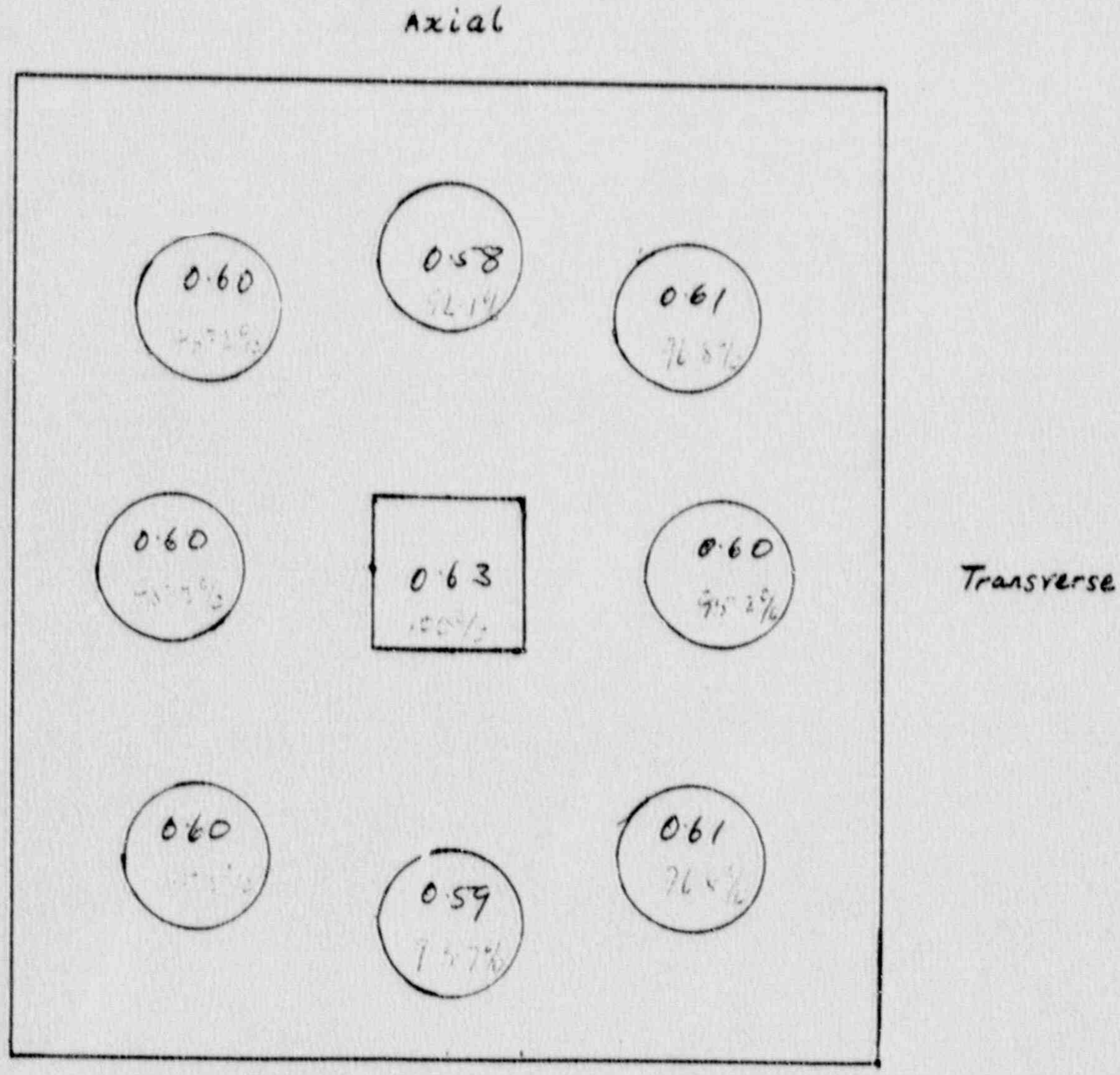


Transverse

No. of axis uniformity = 3·1%

UNIFORMITY CHECK – FILM

GANTRY ANGLE: 90°

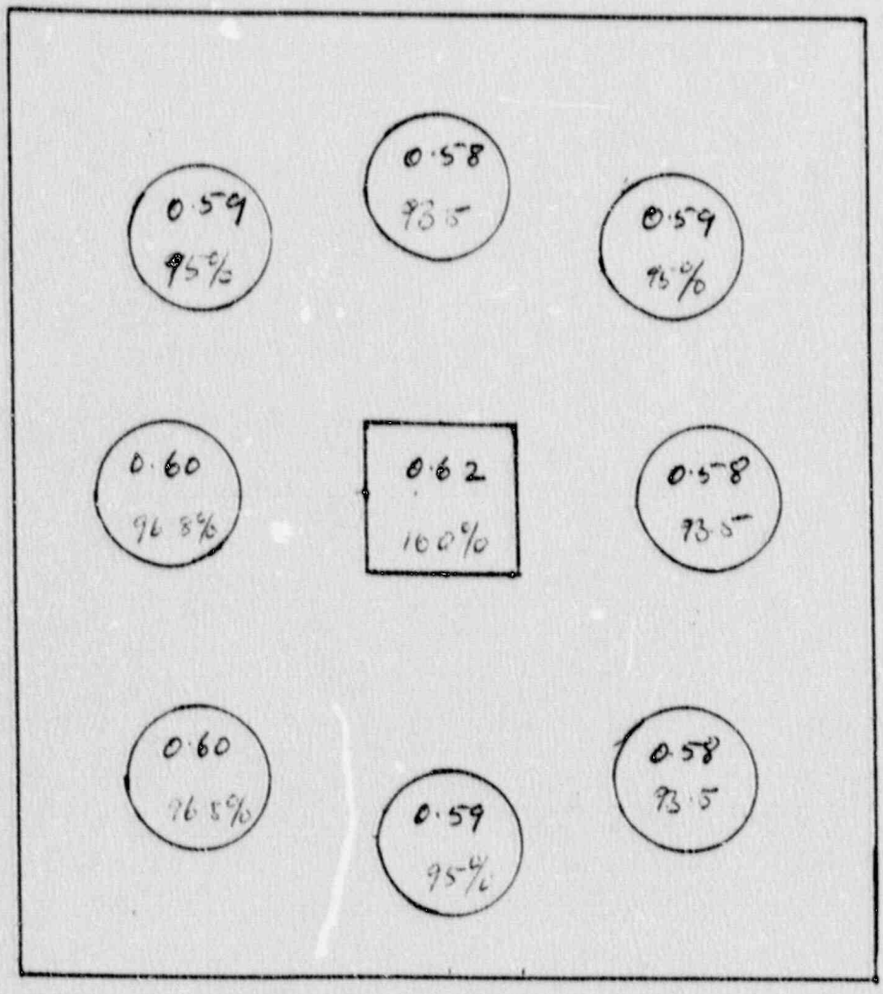


Max off axis variation – 4·7%

UNIFORMITY CHECK - FILM

GANTRY ANGLE : 270°

Axial



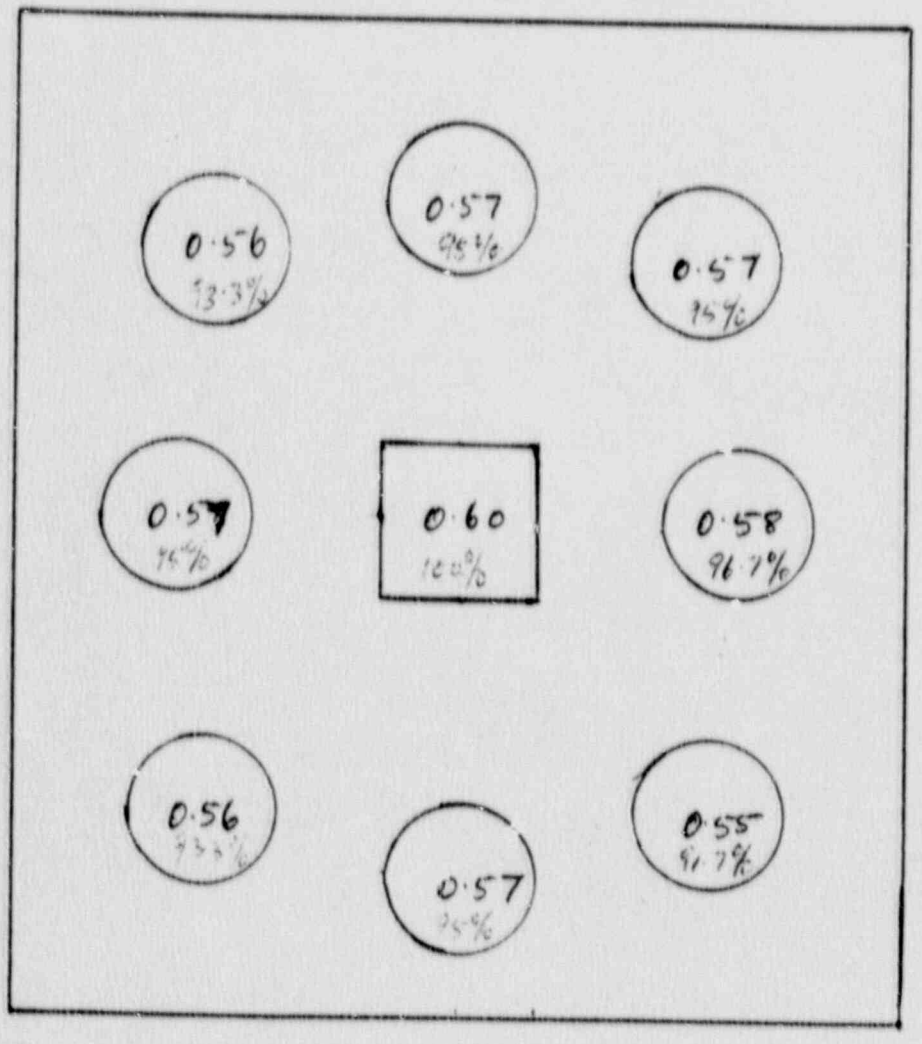
Transverse

Max. off-axis variation = 3.3%

UNIFORMITY CHECK - FILM

GANTRY ANGLE : 0° (360°)

Axial



Transverse

Maximum variation of off-axis points = 5%