



RED/DCB

October 30, 1990

Mr. George M. McCann
United States
Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

License No. 48-12016-01
Docket No. 030-06763

Dear Mr. McCann:

Thank you for your letter dated September 7, 1990 referencing the July 2 and 3, 1990 inspection conducted by Messrs. D.R. Gibbons and W.T. King. We have thoroughly reviewed the letter and accompanying notice of violation and we are pleased to respond.

Item 1.a.

Included in our Company's last license renewal, was a request to use Am 241 Be sources up to 300 mCi. This represented a seven fold increase over our previously authorized activity of 40 mCi. It was our understanding through verbal discussions with regulatory staff that the use of larger neutron sources required additions to the present safety program, one being neutron surveys. As of the date of this writing we have not received any Am 241 Be sources larger than 40 mCi and therefore did not begin any routine neutron area surveys.

In the spirit of compliance and for our own information, we did use a neutron survey meter for several months when performing some research on a custom device containing four 40 mCi Am 241 Be sources. The survey meter was utilized to (a) evaluate the effectiveness of various shielding materials and configurations, (b) perform neutron surveys of the custom device, and (c) monitor personnel exposure levels. This instrument was on premises when the inspectors visited our facility.

We have a history of low employee exposure to neutron radiation. Dosimetry reports indicate that it is extremely unusual for an employee to receive more than a "minimal" for neutron exposure. In reviewing our records over the last 10 years we have only had eight occurrences of employees receiving up to 30 mR exposure for either a 2 week or 4 week period. No measurable neutron exposures have occurred since 1986.

We will have a neutron survey instrument available on or before such time as Am 241 Be sources larger than 40 mCi are acquired.

Item 1.b.

The unrestricted area survey for first quarter 1990 was in fact completed. The record of for this period was lost. We are confident this is the case because unrestricted area surveys and

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data for that period. The survey results were transferred to a new form and unrestricted survey data for one quarter was accidentally omitted in the process.

We have established a calendar based reminder system for various regulatory concerns including surveys.

In review of our survey program, it should be mentioned that no survey in either unrestricted or restricted areas has ever yielded unusual results. In fact, due to the addition of shielding in February, radiation levels are now one-half to one-tenth of previous values in storage and work areas. See radiation safety program review for details. These lower radiation levels are reflected in correspondingly lower employee exposures as noted by dosimetry results.

Item 2.

To comply with our license conditions we have added a column to our source inventory report indicating quantity (mCi) of each source. It may be of interest to note that the nominal quantity of each source in inventory is known. This is due to the fact that we utilize only four different sources. These sizes are readily identifiable by isotope, manufacture and serial number found in the inventory record. We have a separate record of precise activities (± 0.1 mCi) for each source in the source manufactures certificates. This data will be added to the source inventory report. Copies will be obtained from the source manufacture of any missing source certificates to complete the record and source inventory report. The source inventory report now contains quantities, kinds and locations of byproduct material.

As noted, two source inventories, one in 1987 and one 1988 were performed at a eight month intervals instead of six months. We identified this problem and have corrected it. Source inventories have been performed on a timely basis since 1988 and will continue to be. Future radiation safety program reviews will pay particular attention to the timeliness, accuracy and information content of the source inventory.

Item 3.

Surface and 1 meter radiation surveys are now conducted on all outgoing radioactive packages.

Per Mr. Gibbons suggestion we enclosed a copy of our radiation safety program review.

Mr. George M. McCann
Nuclear Regulatory Commission

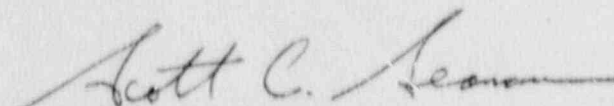
Page 3

Corrective actions for all items will be achieved by November 13, 1990.

If you have any questions or comments, please do not hesitate to contact me.

Sincerely,

Seaman Nuclear Corporation



Scott C. Seaman
President

Enclosures

Seaman Nuclear Corporation
Radiation Safety Program Review
October 1990

One of the requirements of our NRC license is an annual review of our radiation safety program by the Company management. This review examines personnel exposure levels, results of area surveys, accuracy of source inventory records and compliance with license conditions and NRC regulations.

Over the last several years we have continually strived to even further reduce radiation exposures. A variety of steps have been implemented resulting in lower exposure levels as measured by survey instruments and personal monitoring devices. These improvements were achieved by (a) adding shielding to storage and work areas and (b) refining source and gauge handling procedures.

Many of the steps taken to lower personnel exposure have been small, but some have been large. Their cumulative effect can be seen by observing several years of area surveys and dosimetry reports. These improvements are summarized below.

Improvements in the source loading operation

The operation of loading the sealed sources into meters was studied. Work simplification methods were employed and fixtures were constructed to (a) reduce the time required for the entire process, (b) increase the distance between the source and the operator (c) increase the amount of shielding used and (d) decrease the amount of time which the operator would be exposed to an unshielded source. The source loading operation is performed at a dedicated station, where the operator stands behind lead shielding using long handle tools. A lighted magnifying lamp allows source inspection and identification at 30 inches. If more lengthy detailed inspection is required, a fixture using magnifying mirrors is used. This fixture allows the operator to be completely behind lead shielding when viewing the sealed sources.

Shielding added in storage and work areas

In February 1990, solid concrete block walls were erected in the source and meter storage area to reduce radiation levels. This shielding is illustrated on attached inventory area survey. This survey was conducted in the presence of NRC inspector, Messrs. Gibbons and King.

The main shielding wall is 24 inches thick, other walls are 16 inches. Since the wall was constructed, the following reductions in radiation levels have been observed: In the inventory isles, behind the shielding wall, the radiation level has been reduced to less than 1/10 of former levels. In the meter storage area the level has been reduced to approximately 1/2 or less due to (a) shielding between some storage shelving, (b) wider isle width to increase distance between worker and meters and (c) more efficient identification system for meters to reduce search time.

Shielding has also been erected in the calibration area (not shown). Radiation in the shop area is now down to less than 0.1 mR/hr.

Technicians remove the source and its shield from the work area during many service operations. When they must work near a source, technicians are encouraged to use additional lead and polyethylene for shielding. In many cases it is found that half value layers of shielding can be used. Greater thicknesses can sometimes be used depending on space limitations in the equipment.

New product research has been conducted during 1989 and 1990. Survey measurements were conducted to evaluate potential source shield combinations. A "neutron ball" was borrowed for several months to evaluate neutron levels.

Worker training is emphasized as an important key to lowering exposure levels. Worker feedback on new procedures and suggestions for lowering exposure levels are encouraged and elicited.

Lower radiation exposures

Actual worker exposures have been significantly reduced over the last several years. Gamma and neutron exposures are monitored monthly by whole body and ring dosimeters. Pocket dosimeters are also utilized. The result of the personnel monitoring is summarized graphically on attached Technicians Trend Analysis. This graph illustrates the downward trend in employee exposures over the last three years. This graph was shown to Messrs. Gibbons and King of the NRC during an inspection. The horizontal axis lists the exposures of each technician, grouped by calendar quarter. You will notice that each quarter has 3 or 4 technicians. Several points for each quarter correspond with the quarterly exposure of several technicians. The two highest readings result from two individuals, noted for their carelessness in their work habits. They are no longer employed by us.

To summarize the dosimetry results, it was found that: (a) Whole body gamma exposures to technicians have been reduced from approximately 24% of allowable to 14% over the last 3 years. A 41% percent reduction. (b) Extremity exposures are generally 2 to 3% of allowable, with the highest exposure 6.9%. They also correlate predictably with whole body readings. (c) No measurable neutron exposures have occurred since 1985.

Source inventory review

Physical comparisons of sources with the inventory records were performed. The source locations and the information on the

inventory reports were found to be orderly, accurate and meeting regulatory requirements.

Summary of 1990 NRC inspection

In July, two NRC inspectors visited our facility and conducted an inspection for one and one half days. The inspection included review of dosimetry reports, area survey results, source inventory, shipping procedures and paperwork, and other requirements of our license. The inspectors were positive about our program and the reductions we have made in personnel exposures. They did however find four areas of noncompliance. These violations involved surveys of shipping packages, area surveys and additional data required for the source inventory record. No problem discovered was severe in nature. Each concern of the inspectors has been addressed, correcting the problem area. For more details see the NRC letter date Sept 7, 1990, and our letter of response dated October 30, 1990.

Regulatory compliance

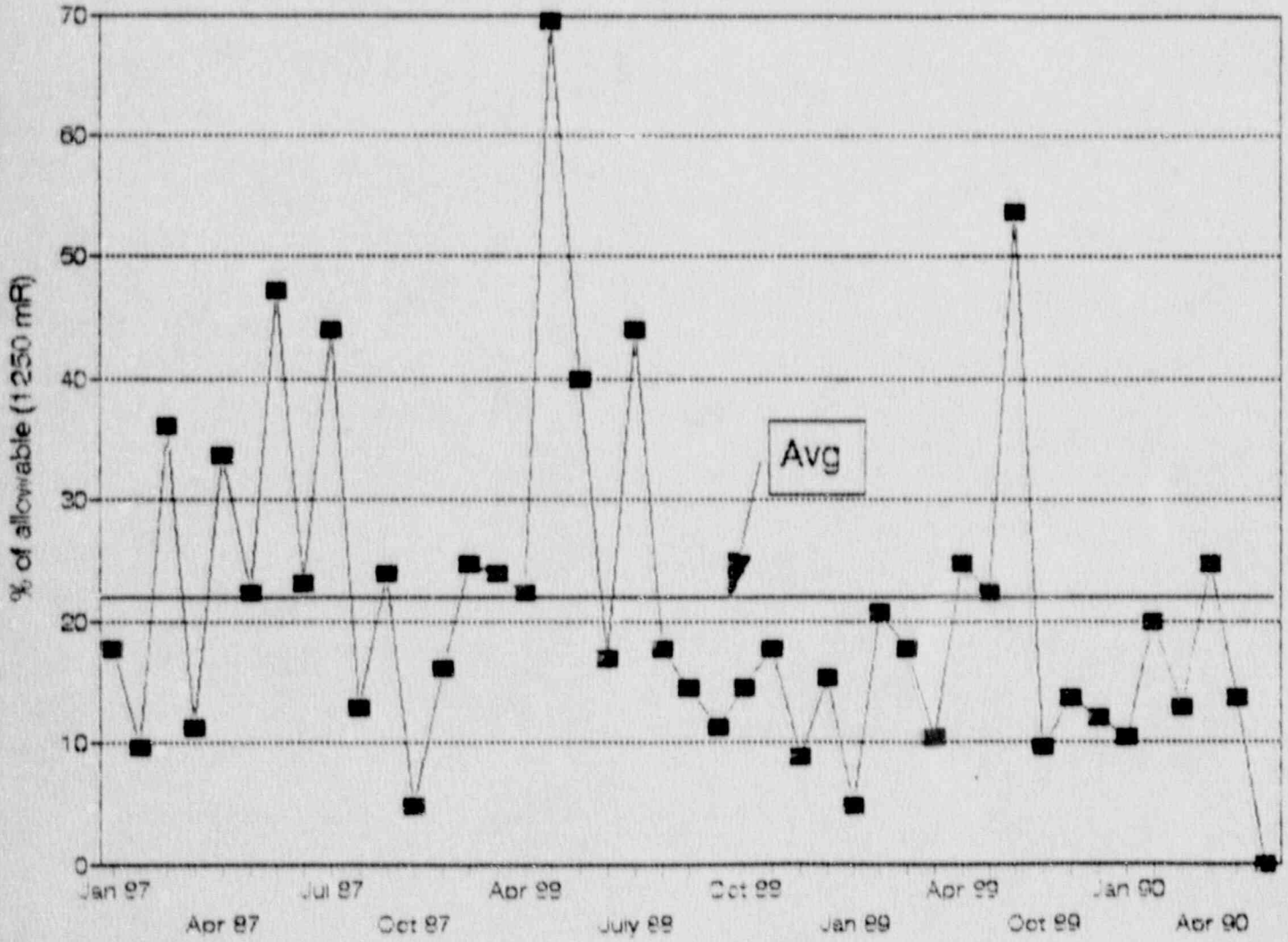
To insure continued regulatory compliance we are taking the following actions: (a) key employees are reading our NRC license and supporting letters; (b) regulatory guides and CFR sections pertinent to each persons activities are also being read; (c) inspection results are being shared.

Our self assessment in this radiation safety program review has demonstrated that the Company is committed to lowering personnel exposures and meeting regulatory requirements.

Scott Seaman
RSO

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Technicians Trend Analysis

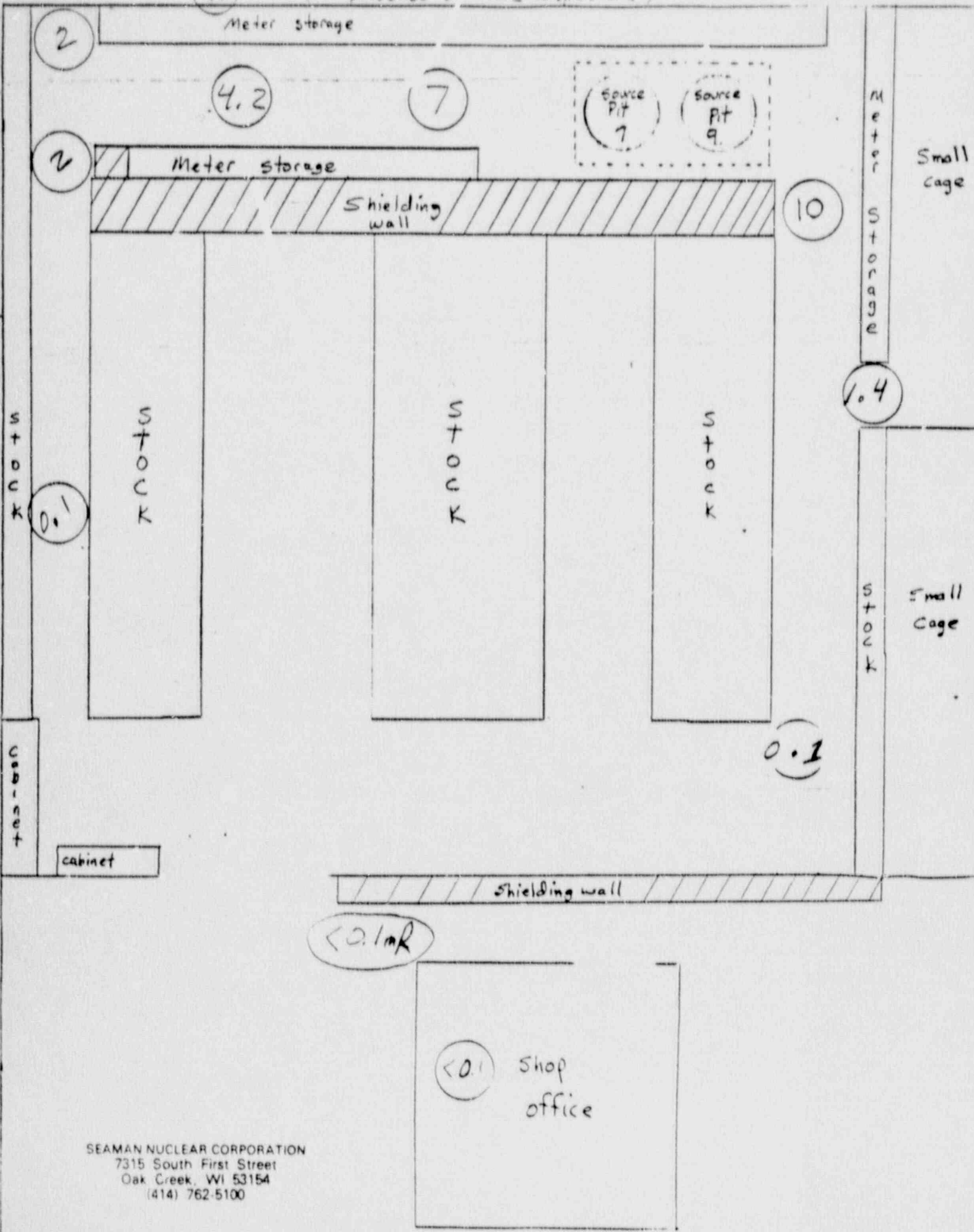


1000 - change
post date 9/25/80
All readings in mR

Inventory Area Survey

(in presence of NRC inspectors)

July 3, 1990



2

4.2

7

Source Pit 7

Source Pit 9

2

Meter storage

Shielding wall

10

Meter Storage

Small Cage

1.4

STOCK

STOCK

STOCK

STOCK

STOCK

Small Cage

Cabinet

cabinet

0.1

Shielding wall

<0.1 mR

<0.1 Shop office