OAK RIDGE NATIONAL LABORATORY

operated by
UNION CARBIDE CORPORATION

for the
U.S. ATOMIC ENERGY COMMISSION

MASTER

ORNL-NSIC-53

20,929

RADIOGRAPHY INCIDENTS AND OVEREXPOSURES

R. L. Scott

R. B. Gallaher

NUCLEAR SAFETY INFORMATION CENTER

NSIC

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency Thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

AVAILABILITY OF NSIC DOCUMENTS

Recent NSIC reports that may be ordered from the National Technical Information Service, U.S. Department of Commerce, Springfield, Virginia 22151:

<u>ORNL-NSIC-</u>	<u>Title</u>	<u>Price</u>
55	Design Data and Safety Features of Commercial Nuclear Power Plants, Vol. II, Docket No. 50-296 through 50-395, by F. A. Heddleson, January 1972.	\$15.00
74	Calculation of Doses Due to Accidentally Released Plutonium from an LMFBR, By B. R. Fish, G. W. Keilholtz, W. S. Snyder, and S. D. Swisher, November 1972.	\$15.00
82	Chemical and Physical Properties of Methyl Iodide and Its Occurrence Under Reactor Accident Conditions — A Summary and Annotated Bibliography, by L. F. Parsly, December 1971.	\$12.00
91	Safety-Related Occurrences in Nuclear Facilities as Reported in 1970, by R. L. Scott, December 1971.	\$10.00
93	Summary of Recent Legislative and Regulatory Activities Affecting the Environmental Quality of Nuclear Facilities, by R. H. Bryan, B. L. Nichols, and J. N. Ramsey, May 1972.	\$10.00
97	Indexed Bibliography of Thermal Effects Literature-2, by J. G. Morgan and C. C. Coutant, May 1972.	\$10.00
98	Compilation of U.S. Nuclear Standards, 8th Edition, 1971, by J. P. Blakely, February 1972.	\$12.00
99	Index to <i>Nuclear Safety</i> , A Technical Progress Review by Chronology, Permuted Title, and Author, Vol. 1, No. 1 Through Vol. 12, No. 6, by J. P. Blakely and Ann S. Klein, May 1972.	\$ 8.00
101	Indexed Bibliography on Environmental Monitoring for Radioactivity, by B. L. Houser, May 1972.	\$10.00
102	Compilation of National and International Nuclear Standards (Excluding U.S. Activities) 8th Edition, 1972, by J. P. Blakely, June 1972.	\$10.00
103	Abnormal Reactor Operating Experiences, 1969-1971, by R. L. Scott and R. B. Gallaher, May 1972.	\$ 8.00
105	Indexed Bibliography on Nuclear Facility Siting, by H. B. Piper, June 1972.	\$10.00
106	Safety-Related Occurrences in Nuclear Facilities as Reported in 1971, by R. L. Scott and R. B. Gallaher, September 1972.	\$12.00

Contract No. W-7405-Eng-26

Nuclear Safety Information Center

RADIOGRAPHY INCIDENTS AND OVEREXPOSURES

R. L. Scott
Operations Division

R. B. Gallaher
Reactor Division

DECEMBER 1972

NOTICE

This report was prepared as an account of work sponsored by the United States Government. Neither the United States nor the United States Atomic Energy Commission, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately owned rights.

OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37830
Operated by
UNION CARBIDE CORPORATION
for the
U.S. ATOMIC ENERGY COMMISSION

Printed in the United States of America. Available from
National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road, Springfield, Virginia 22151
Price: Printed Copy \$10.00; Microfiche \$10.00

This report was prepared as an account of work sponsored by the United States Government. Neither the United States nor the United States Atomic Energy Commission, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately owned rights.

CONTENTS

	<u>Page</u>
Foreword.	v
Abstract.	1
Introduction.	1
Analysis of Literature.	3
Conclusions	5
Parts and Method of Indexing.	8
I. Incidents and Exposures.	9
II. Miscellaneous References	63
III. Keyword Index.	73
IV. Author Index	77

THIS PAGE
WAS INTENTIONALLY
LEFT BLANK

FOREWORD

The Nuclear Safety Information Center, established in March 1963 at the Oak Ridge National Laboratory under the sponsorship of the U.S. Atomic Energy Commission, is a focal point for the collection, storage, evaluation, and dissemination of nuclear safety information. A system of keywords is used to index the information cataloged by the Center. The title, author, installation, abstract, and keywords for each document reviewed are recorded at the central computer facility in Oak Ridge. The references are cataloged according to the following categories:

1. General Safety Criteria
2. Siting of Nuclear Facilities
3. Transportation and Handling of Radioactive Materials
4. Aerospace Safety
5. Heat Transfer and Thermal Transients
6. Reactor Transients, Kinetics, and Stability
7. Fission Product Release, Transport, and Removal
8. Sources of Energy Release under Accident Conditions
9. Nuclear Instrumentation, Control, and Safety Systems
10. Electrical Power Systems
11. Containment of Nuclear Facilities
12. Plant Safety Features — Reactor
13. Plant Safety Features — Nonreactor
14. Radionuclide Release and Movement in the Environment
15. Environmental Surveys, Monitoring, and Radiation Exposure of Man
16. Meteorological Considerations
17. Operational Safety and Experience
18. Safety Analysis and Design Reports
19. Radiation Dose to Man from Radioactivity Release to the Environment
20. Effects of Thermal Modifications on Ecological Systems
21. Effects of Radionuclides and Ionizing Radiation on Ecological Systems

Computer programs have been developed which enable NSIC to (1) operate a routine program of Selective Dissemination of Information (SDI) to individuals according to their particular profile of interest, (2) make

retrospective searches of the stored references, and (3) distribute scope and progress information on R&D contracts from the Program and Project Information File (PPIF).

Services of the NSIC are available to government agencies, research and educational institutions, and the nuclear industry on a partial cost recovery basis designed to regain a portion of the expense associated with disseminating the information to the user. A minimal inquiry response is available free. NSIC reports (i.e., those with the ORNL-NSIC numbers) may be purchased from the National Technical Information Service (see inside front cover) while documents indexed by NSIC may be examined at the Center by qualified personnel. Inquiries concerning the capabilities and operation of the Center may be addressed to:

J. R. Buchanan, Assistant Director
Nuclear Safety Information Center
Post Office Box Y
Oak Ridge National Laboratory
Oak Ridge, Tennessee 37830

Telephone 615-483-8611, Ext. 3-7253
FTS number is 615-483-7253

ABSTRACT

Radiography is a process of visualizing the interior of objects opaque to light by using penetrating radiation such as x-rays or gamma rays. This report contains 302 abstracts of documents related to various aspects of radiographic operations covering the period from June 1963 through December 1971. The documents include personnel exposures as well as incidents resulting from personnel errors, management errors, and mechanical failures. A brief review of the documents was made and the information compiled to provide some insight into possible methods of reducing the personnel exposures as well as the operator and management errors in radiographic operations.

INTRODUCTION

Radiography is a process of visualizing the interior of objects opaque to light by using penetrating radiation such as x-rays or gamma rays. Radiation passing through material is absorbed — the amount depending on the thickness and density of the material. By exposing a radiographic film to the emerging radiation an image is obtained of the radiation intensity variation. Thus, a visible film record of the internal conditions of the object is obtained without damaging the object.

AEC regulations published in the *Code of Federal Regulations*, Title 10, Parts 20, 30, and 34 are particularly applicable to radiography. These regulations require that licensees have equipment and facilities adequate for protection of health, life, and property, and that they be thoroughly qualified by training and experience in the use of by-product material according to required safety measures. Licensee obligations include control of radiation levels and personnel exposures, maintenance of inventory records, providing instruction to employees, and other responsibilities to help ensure public safety and welfare. In addition, licensees are required to notify AEC if an unusual event occurs, such as radioactivity releases, loss or theft of radioactive materials, and excessive radiation exposures to personnel.

Correspondence between radiography licensees and the U.S. Atomic Energy Commission (USAEC) on file at the Nuclear Safety Information Center (NSIC) was compiled for the purpose of reviewing radiation exposures to personnel in radiography operations and to obtain a better perspective for minimizing the number of such incidents. The material covers the period from June 1963 through December 1971, and is arranged alphabetically according to company, where the incident occurred, and then chronologically. In some cases, the information is very brief but most of the summaries describe the incidents and include dates, exposure doses, and corrective measures taken to prevent a recurrence of the incident.

A bibliography of the incidents and exposures is contained in Section I. Section II is a bibliography of miscellaneous references, consisting of regulations, safety requirements, techniques, and training guides. Section III contains a keyword index; and Section IV contains an author index. A review of the keyword index may be made to determine those abstracts which are concerned with a specific piece of equipment, the type of failure involved, or the cause of a failure. Before reviewing the bibliography, it is suggested that a few moments of study be given to the figure "Parts and Methods of Indexing Abstracts" which shows a typical abstract with its component parts identified. Note the availability and list of keywords. By scanning the keywords given for each abstract, one can gain a quick indication of the contents.

The most common radiation sources are x-ray machines and encapsulated radioactive isotopes such as Cobalt-60 or Iridium-192. The major proportion of the incidents discussed involve the use of radioactive isotopes which are by-products of the fission process. The use of such by-product materials is regulated by the AEC to help ensure the safety and welfare of the public. The use of x-ray equipment is not regulated by the AEC, and no conclusion regarding relative exposures can be drawn from such incidents in this compilation.

A brief analysis of the documents in the bibliography has been made and tables prepared indicating the types of failures and extent of personnel exposures. The conclusions and findings of the analysis follow.

Analysis of Literature

The responsibilities of the radiographer or radiographer's assistant include the surveillance of the radiographic operation to prevent unauthorized entry into a high-radiation area, posting of areas wherein radiography is being performed, the performance of a survey after each radiographic exposure, and the maintenance of records of surveys performed on shielded sources which are to be left without direct surveillance.

The resolution most frequently violated by individual radiographers is 10 CFR 34.43(b): "A physical radiation survey shall be made after each radiographer's exposure during a radiographic operation to determine that the sealed source has been returned to its shielded condition."

Table 1 lists the operator errors. There were 42 instances in which the radiographer failed to perform a survey, and another 20 in which the surveys were inadequate. A common cause was an inadequate survey coupled with a situation in which the source for one reason or another was not fully retracted and, therefore, was shielded in every direction except directly forward of the storage device. During film exchange, the radiographer would survey the storage device from one side or the rear and, finding no radiation field, he would incorrectly assume that the source was completely shielded. Proceeding with the film exchange, he would then place himself directly in the radiation beam emanating from the front of the storage device.

Table 1. Operator Errors

	%	No.
1. Survey not performed	40	42
2. Survey inadequate	19	20
3. Source not fully returned into shield	12	13
4. Procedure not followed	10	11
5. Badge or dosimeter not worn	8	8
6. Radiation signs not posted	4	4
7. Source not connected to cable	3	3
8. Inadequate communications	2	2
9. Preoccupied with personal matters	2	2

Contributing factors to operator failures were: preoccupation with personal matters, demand for high production, and the time period in which the operations were performed, i.e., between midnight and 8 a.m.

Table 2 lists management errors. Citations for these failures were quite varied; the most frequent was a failure to maintain proper records. Other frequent infractions included: (1) permitting unqualified or unauthorized personnel to perform radiography, (2) failing to calibrate instruments on a regular basis, (3) inadequate training programs, (4) unauthorized possession or use of equipment, and (5) permitting radiation levels on carriers and in unrestricted areas to exceed the limits.

Table 2. Management Errors

	%	No.
1. Inadequate records	27	38
2. Permitted radiography by unqualified or unauthorized personnel	10	14
3. Failed to calibrate instruments regularly	8	11
4. Inadequate training program	7	10
5. Unauthorized possession or use of equipment	7	10
6. Improper storage of source	6	9
7. Allowed radiation levels to exceed limits on carrier surface or in unrestricted areas	6	9
8. Storage and radiation areas not posted	5	7
9. Overexposures not reported	5	7
10. Containers and exposure devices not labeled	4	6
11. Sources not leak-tested	4	6
12. Film badges not processed immediately	4	6
13. Area radiation control or warning system inadequate	3	4
14. Employees not provided with copy of procedures or AEC regulations	2	3
15. Device modified without authorization	1	1
16. Personnel exposure not evaluated	1	1

Table 3 lists the mechanical failures. The most frequent of these was the sticking of the source in the guide tube. Some of the incidents may have been due to an operator error, but the information was insufficient to make this determination.

Table 3. Mechanical Failures

	<u>%</u>	<u>No.</u>
1. Source stuck in guide tube	28	22
2. Faulty equipment	26	21
3. Lost source	24	19
4. Leaking source	10	8
5. Separation of source and cable	8	6
6. Source fell apart	2	2
7. Faulty badge	1	1
8. Lost film badge	1	1

Table 4 lists the doses received as a result of the incident. Of the incidents that included radiation exposures, 57 were whole-body exposures of 5 rem or less and 42 reported exposures that exceeded 5 rem. Twenty-five incidents included hand exposures, with doses ranging up to a possible 10,000 rem.

Table 4. Doses Received From Incidents

Whole Body Dose	%	No.	Dose to Hands	%	No.
0- 2 rems	15	15	0- 500 rems	68	17
2.1- 5 rems	42	42	500-10,000 rems	32	8
5.1- 10 rems	19	19			
10.1- 50 rems	19	19			
50.1-1000 rems	4	4			

Conclusions

Failure of the operators to survey properly, combined with mechanical difficulties, was predominant in most of the personnel-exposure incidents. Because of limited information, there may be some question as to whether the mechanical difficulties reported (e.g., source sticking in the guide tube, separation of source and cable, and faulty equipment) were truly mechanical or whether they were precipitated by operator negligence. It

is obvious, however, that most of the exposures could have been avoided had the operator surveyed properly to determine the condition of the source.

"Why do radiographers fail to make an adequate survey?" Some answers put forth by licensees are: pressures of field work, demands for high production, preoccupation with personal matters, and the use of part-time radiographers in a "seasonal business." Other factors may be: the time period in which radiography is performed, and an inadequate awareness of the consequences of unnecessary exposure to radiation.

If a radiographer is the sole representative of a company at a remote installation, without the on-site backing of his supervision, it is not unlikely that pressures exerted on him by the customer for quantity production will result in his forfeiting some safe practices in order to meet the demands. This situation should be recognized by supervision and discussed with all radiographers to make the point made that safety should not be sacrificed for speed.

Several of the incidents were identified as having occurred between midnight and 8 a.m. Anyone who has worked during this time period is aware that his physical and mental faculties are slightly impaired. However, the performance of radiography after normal working hours is desirable because there are fewer people around to become accidentally exposed or interfere with the operations; and also, construction and fabrication work performed during normal working hours will not be interrupted.

All these factors, i.e., pressure for production, preoccupation with other matters, dulled senses, and any others which result in inadvertent failure to survey should be met with an auxiliary method of radiation monitoring. For example, the use of a pocket radiation alarm (personal radiation monitor) should be mandatory in addition to the required survey. These radiation monitors are lightweight, compact, and easily carried in shirt pockets. They provide a chirping or buzzing sound which increases in frequency as the radiation intensity increases to alert the user when he strays into a radiation field. The pocket radiation alarm offers added protection to the radiographer without requiring any action by him, such as adjusting and reading a survey meter. It requires only the ability to hear and respond.

The use of part-time radiographers is a practice affected by economic considerations. However, the level of competence of such individuals and their incentive to follow safe practices may be open to question. If radiographers were licensed by the AEC, evidence of negligence or incompetence could be met by revocation of the license. This would prevent such individuals from moving from one company to another and should help develop a professional attitude in the industry.

Another contributing factor in the radiographer's apparent laxity may be that radiographers have not been adequately informed of the relationship between radiation dose and biological effects. This could result in a nonchalant attitude toward personal exposure. The primary aim in training programs is to provide the trainee with enough knowledge to produce quality radiographs; however, the subjects of personal safety, the safety of others, and biological effects of radiation should be treated quite thoroughly.

Many of the management failures were determined by AEC inspections; and while several could be corrected simply and immediately, such as labeling storage containers and posting radiation areas, the need for increased vigilance calls for improving the training programs, preventing unqualified radiographers from performing radiographic operations, and paying more attention to maintenance of records.

The number of mechanical failures could be reduced by an improved design of the source-to-cable connector. A fail-safe connector is needed — one that would prevent the source from being extended from the shield unless positively attached to the drive cable so that retraction could be assumed. An effective preventive-maintenance program, with more attention devoted to cleanliness of the source guide tube, would increase the reliability of the equipment.

In summary, to minimize the occurrence of incidents, operators should be more diligent in the performance of radiation surveys during radiographic operations; management should devote more attention to the preparation and maintenance of records; and additional effort should be expended to minimize mechanical failures of the radiography-exposure devices.

PARTS AND METHOD OF INDEXING ABSTRACTS

I - INCIDENTS AND EXPOSURES

48191

AEC NOTES CORRECTIVE ACTIONS TAKEN BY COMPANY
U.S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE
1 PAGE, LETTER - DIVISION OF COMPLIANCE TO AMERICAN OIL COMPANY, JUNE 17, 1970

COMPANY TO ENSURE THAT SOURCES ARE RETRACTED INTO THEIR SHIELDS AFTER USE. WILL ALSO ENSURE THAT RADIOGRAPHERS CAN SAFELY OPERATE NEWLY ACQUIRED EQUIPMENT.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*FAILURE, OPERATOR ERROR + *FAILURE, ADMINISTRATIVE CONTROL + IRIIDIUM

25347

NONCOMPLIANCE CITATION OF ARNOLD GREENE RADIOGRAPHY
ARNOLD GREENE TESTING LABORATORIES, INC., NATICK, MASS. + DIVISION OF COMPLIANCE
2 PAGES, ATOMIC ENERGY CLEARING HOUSE, 14(21), PAGES 15-16 (MAY 20, 1968)

(CITATION, FEB. 23) A NOV. 29-30, 1967, INSPECTION AT THE WEST END IRON WORKS SHOWED (1) SURVEYS WERE NOT MADE AFTER EACH EXPOSURE, (2) UTILIZATION LOGS WERE NOT KEPT. ON NOV. 24, TWO EMPLOYEES RECEIVED FILM-BADGE DOSES OF 36 AND 14 REMS, BUT YOUR LETTER OF DEC. 8, 1967, REFERS ONLY TO 2.5-REM CALCULATED DOSES. (REPLY, MAR. 12) ALL RADIOGRAPHERS WERE RETRAINED, AND ONE OF THE MEN IN THE INCIDENT EXPLAINED HOW HE RECEIVED HIS OVEREXPOSURE. BADGE REPORTS SHOW CONSIDERABLY LESS EXPOSURE LATELY. UTILIZATION LOGS ARE BEING KEPT.

*PERSONNEL EXPOSURE, RADIATION + *FAILURE, ADMINISTRATIVE CONTROL

37492

OVEREXPOSURE AT ARNOLD GREENE TESTING LABORATORIES X-RAY MACHINES
ARNOLD GREENE TESTING LABORATORIES, INC., NATICK, MASS.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE, 15(33), PAGE 27 (AUGUST 18, 1969)

TWO TECHNICIANS RECEIVED GREATER THAN 1.25 REM WHEN EXPOSED TO SCATTER RADIATION WHERE AN X-RAY MACHINE WAS USED INSTEAD OF AN ISOTOPE SOURCE. THE RADIATION WAS NOT EXCESSIVE. ADDITIONAL LEAD PANELS ARE BEING INSTALLED TO REDUCE THE SCATTER RADIATION FROM STEEL STRUCTURE OF BUILDING.

*PERSONNEL EXPOSURE, RADIATION + SHIELDING + *X-RAY

17117

ATLANTIC X-RAY INC. CITED FOR NONCOMPLIANCE
ATLANTIC X-RAY, INC., NORRISTOWN, PA.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 13(33), PAGE 25 (AUGUST 14, 1967)

(LETTER, JUNE 7) SIX ITEMS OF NONCOMPLIANCE NOTED WERE - (1) RECORDS PURPORTED TO SHOW A CERTAIN INDIVIDUAL CALIBRATED SURVEY INSTRUMENTS DURING A CERTAIN PERIOD WHEN HE DID NOT, (2) OPERATIONS WERE CONDUCTED WITHOUT USING CALIBRATED INSTRUMENTS, (3) AN INDIVIDUAL WAS ALLOWED TO ACT AS A RADIOGRAPHER WITHOUT DEMONSTRATING UNDERSTANDING OF 10 CFR 36 APPENDIX A, (4) THREE SEALED SOURCES WERE NOT LEAK TESTED AT 6-MONTH INTERVALS, (5) RECORDS WERE NOT MADE OF SURVEYS TO SHOW SOURCES RETURNED TO SHIELD, AND (6) OTHER RECORDS OF SURVEYS WERE NOT MADE.

SOURCE, RADIATION + *SURVEY, RADIATION + TEST, LEAK LOCATION + FAILURE, ADMINISTRATIVE CONTROL

09280

MCCUE JK
EXPOSURE AT AVONDALE SHIPYARDS, MARCH 12, 1966
AVONDALE SHIPYARDS, INC., NEW ORLEANS, LOUISIANA
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 12(16) PAGE 27, APRIL 18, 1966

RADIOGRAPHER RECEIVED FILM-BADGE DOSE OF 5 REMS WHILE CLOSING STUCK DOOR OF IRIIDIUM-192 RADIOGRAPHY UNIT. ESTIMATE BASED ON TIME WAS 1.2 REMS. ADDITIONAL TRAINING BEING GIVEN ON NEED FOR CAUTION, FOR EXAMPLE ROTATING CAMERA OPENING AGAINST WALL AND PLANNING NEXT MOVE.

*FAILURE, COMPONENT + FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION + INCIDENT, RECOVERY FROM

26307

RADIOGRAPHY EXPOSURE AT AVONDALE SHIPYARDS INC.
AVONDALE SHIPYARDS
1 PAGES, TWX TO AEC DIVISION OF COMPLIANCE FROM J.K. MCCUE, APRIL 7, 1967

RADIOGRAPHER RECEIVED ESTIMATED EXPOSURE OF 6 REMS WHEN AN IRIIDIUM SOURCE STUCK IN THE CABLE. DOSIMETER DID NOT INDICATE A DOSE. TWO FILM BADGES ARE TO BE PROCESSED.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

INCIDENT, EQUIPMENT + *PERSONNEL EXPOSURE, RADIATION + INCIDENT, NONREACTOR

12305
LARTY JE
RADIOGRAPHY INCIDENT AT B AND W PLANT, OCTOBER 10, 1966
BABCOCK AND WILCOX COMPANY
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(47), PAGES 15-16 (NOVEMBER 21, 1966)

THE RADIOGRAPHER ENTERED THE WORK AREA PAST THE REMOTE SOURCE-CRANKING DEVICE WITHOUT CRANKING IN THE SOURCE OR MAKING A RADIATION SURVEY AND RECEIVED AN EXPOSURE OF 3.69 R (GAMMA). THE RADIOGRAPHER HAD 2 YEARS OF EXPERIENCE WITH X-RAY EQUIPMENT AND 6 MONTHS WITH THIS 150-CURIE CO-60 DEVICE. THE REASON GIVEN FOR THESE ACTIONS WAS PREOCCUPATION WITH PERSONAL PROBLEMS. AFTER HIS DOSE-RESTRICTION PERIOD IS COMPLETED, HE WILL BE GIVEN A REFRESHER COURSE IN SAFE PRACTICES.

*COBALT + *FAILURE, OPERATOR ERROR + PERSONNEL EXPOSURE, RADIATION + *INCIDENT, HUMAN ERROR

16366
BABCOCK AND WILCOX, MT. VERNON INDIANA, CITED FOR NON COMPLIANCE UNDER LICENSE 13-11317-1
BABCOCK AND WILCOX, MT. VERNON, IND.
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(24) PAGES 13-14 (JUNE 12, 1967)

(LETTER FROM DIV. COMPLIANCE, APRIL 17, REGARDING FEB. 16 INSPECTION, APPARENTLY AUTHORIZED-RELATING TO A RADIOGRAPHY INCIDENT ON OCT. 10, 1966) - A SURVEY WAS NOT MADE AFTER EACH FILM EXPOSURE TO CHECK THAT 141-CURIE CO-60 WAS RETURNED TO THE SHIELD. AN INADEQUATE EVALUATION WAS MADE OF DOSE RECEIVED. THE WARNING SYSTEM WAS A BUZZER ACTIVATED UPON ENTRY TO RADIOGRAPHY ROOM, AND WAS NOT RELATED TO RADIATION LEVEL. (B AND W REPLY, MAY 3) - PROPER SURVEY WAS NOT MADE. DOSE REPORTED NOV. 3 WAS CALCULATED IN GOOD FAITH, HOWEVER FURTHER INFORMATION REPORTED DURING INSPECTION OF FEB. 16 DOES INDICATE AN 8-R CALCULATED DOSE TO UPPER BODY, 3.7-R FILM-BADGE DOSE TO WAIST, AND 27.7/36.6-R CALCULATED DOSE TO L/R HANDS. INCIDENT OCCURRED BECAUSE OF EMPLOYEE PREOCCUPATION WITH PERSONAL MATTERS. WARNING ALARM IS TYPICAL OF THOSE IN OTHER INSTALLATIONS, COMPLIES WITH OUR INTERPRETATION OF 10 CFR 20, AND SHOULD REMAIN AS IS. WE HAVE CHANGED FROM A BELL TO A HORN, AND HAVE POSTED AN AUTHORIZED-ENTRY-ONLY SIGN.

*FAILURE, OPERATOR ERROR + *DOSE MEASUREMENT, EXTERNAL + DOSE CALCULATION, EXTERNAL + PERSONNEL EXPOSURE, RADIATION + *INCIDENT, HUMAN ERROR + FAILURE, DESIGN ERROR

60002
LEAKING SOURCE AT BABCOCK AND WILCOX
BABCOCK AND WILCOX, INDIANA
2 PAGES, LETTER - BABCOCK AND WILCOX TO DIVISION OF COMPLIANCE (AEC) - DECEMBER 14, 1970

.053 MICROCURIES OF REMOVABLE RADIOACTIVE MATERIAL FOUND ON A 20 CI CO SOURCE. SOURCE, STORAGE CONTAINER, AND GUIDE TUBE RETURNED TO VENDOR FOR DECONTAMINATION AND REPLACEMENT OF THE SOURCE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*COBALT + *SOURCE, RADIATION + *LEAK + SURFACE CONTAMINATION

64641
OVEREXPOSURE OF TWO RADIOGRAPHERS (IR-192, 40 CURIES)
BABCOCK & WILCOX COMPANY, BARBERTON, OHIO
7 PAGES, LETTER TO DIVISION OF COMPLIANCE (USAEC) FROM BABCOCK AND WILCOX COMPANY, MAY 17, 1971

SOURCE NOT RETRACTED INTO ITS LEAD HOUSING. RADIOGRAPHER RECEIVED 1.9 REMS TO WHOLE BODY, 30 TO HANDS (CALCULATED). SECOND WORKER RECEIVED 0.720 REM, WHOLE BODY, AND NONE TO HANDS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION + *IRIDIUM + SOURCE, RADIATION

56967
BAKERSFIELD X-RAY SERVICES CITED FOR NONCOMPLIANCE
U. S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE
2 PAGES, LETTER - DIVISION OF COMPLIANCE (AEC) TO BAKERSFIELD X-RAY SERVICES - SEPTEMBER 15, 1970

BAKERSFIELD X-RAY SERVICES FAILED TO FILE A REPORT ON USE OF BYPRODUCT MATERIAL PRIOR TO USE. AN UNAUTHORIZED RADIOGRAPHER WAS USED. HIGH-RADIATION AREAS AND SOURCES WERE NOT LABELED PROPERLY. RECORDS OF SURVEYS AND POCKET DOSIMETERS WERE NOT MAINTAINED. OPERATIONS WERE CONDUCTED WITHOUT THE USE OF A CALIBRATED SURVEY INSTRUMENT. UTILIZATION LOGS WERE NOT MAINTAINED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*FAILURE, OPERATOR ERROR + *SURVEY, RADIATION + *RADIATION SAFETY AND CONTROL + *FAILURE, ADMINISTRATIVE CONTROL + MONITORING SYSTEM, RADIATION + RADIATION EXPOSURE, RECORD KEEPING + *RECORDS

50936

BAKERSFIELD X-RAY SERVICES REPLIES TO LETTER CITING NONCOMPLIANCE
BAKERSFIELD X-RAY SERVICES, INC., CALIFORNIA
1 PAGE, LETTER - BAKERSFIELD X-RAY SERVICES, INC., TO U.S. ATOMIC ENERGY COMMISSION - OCTOBER 5, 1970

FORM 241 WILL BE FILED. RADIOGRAPHER WAS EMPLOYED BY ANOTHER COMPANY AND THEREFORE NOT INCLUDED
ON LICENSE. HE IS NOW. HIGH RADIATION SIGNS HAVE BEEN ORDERED. RECORDS HAVE BEEN TRANSFERRED
TO CALIFORNIA SITE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN.
CHARGE)

*RADIATION EXPOSURE, RECORD KEEPING + *RADIATION SAFETY AND CONTROL + STAFFING

63794

LOST SOURCE
U. S. ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
TELEGRAM TO DIVISION OF COMPLIANCE FROM BENJAMIN COAL COMPANY +. 1 PAGE, MARCH 19, 1971

A 50-MILLICURIE SOURCE OF CS-137 WAS LOST FROM STORAGE. SEARCH BEING CONDUCTED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN.
CHARGE)

*FAILURE, OPERATOR ERROR + *SOURCE, RADIATION, LOST + CESIUM

29702

BESSMER DJ
LEAKING RADIOGRAPHY SOURCE
LETTER TO DIRECTOR, DIV. OF MATERIALS LICENSING, USAEC, WASHINGTON, JULY 22, 1968

ON JULY 18, 1968, A 118-CURIE IR-192 RADIOGRAPHY SOURCE WAS RECEIVED. LEAK TEST SHOWED 0.0130
MICROCURIE IR-192 REMOVABLE CONTAMINATION. SOURCE WILL BE RETURNED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*SOURCE, RADIATION + IRIIDIUM + *LEAK

47207

EMPLOYEE RECEIVES 1316-MILLIREM EXPOSURE (CO-60) DURING ONE-MONTH PERIOD
BLACK SIVALLS AND BRYSON, INC., OKLAHOMA
1 PAGE, LETTER - BLACK, SIVALLS AND BRYSON INC., TO DIVISION OF COMPLIANCE (AEC) - MAY 8, 1968

EMPLOYEE ENTERED RADIOGRAPHIC FACILITY WITHOUT HIS SURVEY METER WHILE THE CO-60 SOURCE WAS
EXPOSED. SHORTLY THEREAFTER ANOTHER OPERATOR ENTERED THE FACILITY WITH THE SURVEY METER AND
DISCOVERED THE EXPOSURE. THEY IMMEDIATELY VACATED THE FACILITY. EMPLOYEE CHECKED DOSIMETER BUT
COULD NOT FIND THE INDICATOR ON SCALE. HE RETURNED TO THE OFFICE AND PLACED THE DOSIMETER IN THE
CHARGER AND RECHARGED. AS A CORRECTIVE MEASURE WE WILL HOLD MONTHLY SCHEDULED MEETINGS WITH ALL
RADIOGRAPHING PERSONNEL TO CAUTION THEM ON THE IMPORTANCE OF SAFE OPERATING PROCEDURES, PRESENCE
OF MIND WHILE WORKING, EMERGENCY PROCEDURES, ETC.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN.
CHARGE)

*PERSONNEL EXPOSURE, RADIATION + *FAILURE, OPERATOR ERROR + COBALT

47205

NAVAL SHIPYARD TAKES CORRECTIVE ACTIONS
BOSTON NAVAL SHIPYARD, MASSACHUSETTS
1 PAGE, LETTER - BOSTON NAVAL SHIPYARD TO DIVISION OF COMPLIANCE (AEC) - MAY 9, 1968

ALL PERSONNEL OF THE NON-DESTRUCTIVE TESTING LABORATORY, BOSTON NAVAL SHIPYARD, HAVE BEEN RE-
ISSUED COPIES OF THE ATOMIC ENERGY COMMISSION 10 CFR PARTS 20, 30, AND 34. RADIOGRAPHERS AND
ASSISTANT RADIOGRAPHERS WILL BE REQUALIFIED ANNUALLY. FILM BADGES ISSUED TO RADIOGRAPHERS FOR
USE DURING NOVEMBER 1967 WERE NOT RETURNED FOR PROCESSING. IT WAS STATED BY THE SUPERVISOR,
RADIOGRAPHY BRANCH, THAT THE BADGES WORN DURING THE MONTH OF NOVEMBER 1967 WERE PLACED IN THE
SHIPYARD MAIL FOR RETURN TO THE PHOTODOSIMETRIST, PER USUAL MANNER. AN EXTENSIVE SEARCH FAILED
TO LOCATE THE MISSING BADGES.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN.
CHARGE)

*MONITOR, PERSONNEL + *TRAINING

26300

ONEIL RW

26309 *CONTINUED*

FAILURE TO SURVEY RESULTS IN OVEREXPOSURES TO RADIOGRAPHERS
BOSTON NAVAL SHIPYARD, BOSTON, MASSACHUSETTS
2 PAGES, ATOMIC ENERGY CLEARING HOUSE, 14(9), PAGES 27-28 (FEBRUARY 26, 1968)

A RADIOGRAPHER AND 2 ASSISTANTS WERE EXPOSED TO A 7.2-CURIE SOURCE WHEN IT FAILED TO RETURN TO ITS SHIELD AND A SURVEY WAS NOT MADE. TWO MEN RECEIVED THEIR DOSE WHILE PERFORMING RADIOGRAPHY, THE THIRD WHILE RETURNING THE TUBE, WHICH CONTAINED THE UNSHIELDED SOURCE, TO STORAGE. INCIDENT DISCOVERED WHEN ANOTHER RADIOGRAPHER SURVEYED THE STORAGE ROOM. ESTIMATED EXPOSURES ARE 2.2 REMS, 800 MILLIREMS, AND A POSSIBLE MAXIMUM OF 230 REMS TO THE THIRD MAN.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION + *INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR

61905

BROADBODUS INDUSTRIAL X-RAY CO. CITED FOR NON-COMPLIANCE
U.S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE
3 PAGES, LETTER - DIVISION OF COMPLIANCE (AEC) TO BROADBODUS INDUSTRIAL X-RAY COMPANY - NOVEMBER 19, 1970.

BROADBODUS INDUSTRIAL X-RAY CO. CITED FOR 11 ITEMS OF NONCOMPLIANCE. ITEMS INCLUDE FAILURE TO STORE A SOURCE PROPERLY, SURVEY INSTRUMENT NOT CALIBRATED, INSPECTION RECORDS NOT MAINTAINED, SOURCE WAS NOT PROPERLY LEAK TESTED, PROPER INVENTORY RECORDS FOR SOURCES WERE NOT MAINTAINED, REPLACEMENT OF A SOURCE DONE BY UNAUTHORIZED WORKERS, UTILIZATION LOGS WERE NOT MAINTAINED, MONITORS WERE NOT MAINTAINED, MONITORS WERE NOT ALWAYS WORN BY WORKERS, SURVEY AND BY-PRODUCT RECEIPT RECORDS WERE NOT KEPT PROPERLY.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*RECORDS + *RADIATION SAFETY AND CONTROL + MONITOR, PERSONNEL + INSTRUMENT CALIBRATION + SOURCE, RADIATION + TEST, LEAK + *FAILURE, ADMINISTRATIVE CONTROL

40445

FILM BADGE EXPOSURE
CHICAGO BRIDGE AND IRON COMPANY, ILLINOIS
2 PAGES, LETTER - CHICAGO BRIDGE AND IRON COMPANY TO AEC DIVISION OF LICENSING AND REGULATION - JUNE 2, 1969

ON APRIL 30, 1969, COMPANY WAS NOTIFIED THAT RADIOGRAPHERS FILM BADGE INDICATED 26 ROENTGENS. INVESTIGATION, BLOOD CHECK, ETC., REVEALED THAT BADGE HAD BEEN DROPPED IN HIGH RADIATION AREA PRIOR TO EXPOSURE. CONCLUDED THAT RADIOGRAPHER WAS NOT EXPOSED. INCIDENT WAS DISCUSSED WITH PERSONNEL, WHO WERE INSTRUCTED TO REPORT ANYTIME FILM BADGE IS DROPPED INTO HIGH-RADIATION AREA.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, OPERATOR ERROR + PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + OPERATING EXPERIENCE

62750

MAJUNCTION OF RADIOGRAPHIC DEVICE
CHICAGO BRIDGE AND IRON COMPANY
4 PAGES, LETTER - CHICAGO BRIDGE AND IRON COMPANY TO DIVISION OF COMPLIANCE (AEC) - MARCH 2, 1971

A 98-CURIE SOURCE OF IR-192 BECAME LODGED IN THE SOURCE TUBE OF A TECH/DPS 533 CAMERA IN AN UNSHIELDED POSITION. OPERATIONS WERE DELAYED 24 HR WHILE PREPARING TO RETURN THE SOURCE TO A SAFE POSITION, WHICH WAS ACCOMPLISHED AFTER THE SOURCE WAS DISLODGED WHEN THE CAMERA WAS DROPPED. THERE WAS NO DAMAGE TO THE CAPSULE, BUT THERE WAS A CRIMP IN THE TUBE WHERE THE SOURCE WAS LODGED. IN FUTURE, DRY RUNS WILL BE MADE USING A DUMMY SOURCE. ALSO, MORE FREQUENT EXAMINATIONS OF EQUIPMENT WILL BE MADE. NO EXCESSIVE EXPOSURES TO WORKERS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*FAILURE, EQUIPMENT + SOURCE, RADIATION + *TEST, SYSTEM OPERABILITY + OPERATING EXPERIENCE

64642

COMBUSTION ENGINEERING CITED FOR 4 ITEMS OF NONCOMPLIANCE
COMBUSTION ENGINEERING, INCORPORATED, WINDSOR, CONNECTICUT
4 PAGES, LETTER FROM DIVISION OF COMPLIANCE TO COMBUSTION ENGINEERING, INC., JUNE 25, 1971

(1) ONE EMPLOYEE RECEIVED 2530 MILLIREMS DURING FIRST QUARTER OF 1971. (2) COMPANY FAILED TO REPORT IT WITHIN 30 DAYS. (3) MODIFIED A RADIOGRAPHIC DEVICE WITHOUT AEC AUTHORIZATION. (4) FAILED TO ASCERTAIN THAT IR-192 SOURCE HAD BEEN RETURNED TO SHIELD AFTER EACH RADIOGRAPHIC OPERATION DURING WORK ON MARCH 7, 1971.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*SURVEY, RADIATION + MODIFICATION + PERSONNEL EXPOSURE, RADIATION + *RADIATION EXPOSURE, RECORD KEEPING

26373
 RADIOGRAPHY INCIDENT - SOURCE FELL APART
 CONAM INSPECTION, INC., TULSA, OKLAHOMA
 2 PAGES, LETTER TO E.R. PRICE (AEC) FROM L.E. COOMBS, SEPTEMBER 30, 1966

SURVEY METER INDICATED THAT SOURCE HAD NOT RETRACTED. THE SOURCE TUBE WAS DISCONNECTED AND SHAKEN SO THE LOOSE SOURCE COULD BE RETRIEVED WITH TONGS. THE SOURCE HAD BECOME UNSCREWED AND FIVE IRIIDIUM PELLETS FELL OUT CNTO THE GROUND. THE EARTH WAS SCOOPED UP AND PELLETS LOCATED. CONTAMINATED DIRT WAS SHIPPED TO LOUISIANA FOR DISPOSAL, AND SOURCE SUPPLIER WAS NOTIFIED SO ACTION COULD BE TAKEN TO PREVENT A RECURRENCE.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

SOURCE, RADIATION + *INCIDENT, EQUIPMENT + *INCIDENT, RECOVERY FROM

18388
 SOURCE REMOVAL DURING MAINTENANCE OF A RADIOGRAPHIC DEVICE
 CONAM INSPECTION, INC., TULSA, OKLA.
 2 PAGES, ATOMIC ENERGY CLEARING HOUSE 131401, PAGE 28 AND 29, (OCT. 2, 1967)

(LETTER, JULY 31) ON JULY 12 A RADIOGRAPHER MAINTAINING A TO-MODEL-490 DEVICE REMOVED 3 SCREWS, DISLODGING SOURCE FROM SHIELD. HE MOVED IT SO IT RETURNED, BUT IT FELL BETWEEN SHIELD AND OUTER CASE. SURVEY METER WENT BACK TO ZERO. MAN WAS CALLED AWAY TO SIGN REPORTS AND RELEASED FROM JOB. NEXT DAY WHEN HE RETURNED TO OFFICE, THE AUTOMATIC GAMMA DETECTOR ALARMED. THE RADIOGRAPHER RECEIVED A 24.5-MR BADGE EXPOSURE. THE DRIVER OF THE OTHER TRUCK CARRYING THE DEVICE WAS ESTIMATED TO HAVE RECEIVED BETWEEN 15 AND 300 R. THE DRIVER QUIT AND HAS NOT COOPERATED IN BEING UNDER A PHYSICIANS OBSERVATION. CAMERAS WILL BE MODIFIED. PROCEDURES WILL NOT BE AMENDED AS THEY FEEL DRIVER WAS SOMEWHAT NEGLIGENT.

*FAILURE, OPERATOR ERROR + MAINTENANCE AND REPAIR + PERSONNEL EXPOSURE, RADIATION + *INCIDENT, HUMAN ERROR + *MONITOR, AREA

41569
 RESPONSE TO NONCOMPLIANCE WITH BYPRODUCT MATERIAL LICENSE
 CONAM INSPECTION, INC. OKLAHOMA
 2 PAGES, LETTER - CONAM INSPECTION INC. TO AEC DIVISION OF COMPLIANCE - JUNE 4, 1968

RESPONDS TO ITEMS OF NONCOMPLIANCE LISTED IN AEC LETTER OF MAY 20, 1968. ITEMS INCLUDE (1) FAILURE TO INSTRUCT RADIOGRAPHER ON ASPECTS OF RADIOGRAPHY - ANSWERED THAT WRITTEN EXAMINATIONS HAD BEEN GIVEN, (2) ADMITTED THAT RADIOGRAPHER CONTINUED OPERATIONS AFTER POCKET DOSIMETER HAD DISCHARGED BEYOND ITS RANGE, THAT A HAND EXPOSURE OF 41 R RESULTED (ON AUG. 31, 1967), AND (3) EACH EMPLOYEE HAS BEEN ISSUED COPIES OF AEC REGULATIONS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

INCIDENT, EXPOSURE + PERSONNEL EXPOSURE, RADIATION + *FAILURE, ADMINISTRATIVE CONTROL

41567
 RADIOGRAPHERS QUARTERLY EXPOSURE EXCEEDS LIMIT
 CONAM INSPECTION, INC., OKLAHOMA
 1 PAGE, LETTER - CONAM INSPECTION INC. TO AEC DIVISION OF COMPLIANCE - SEPTEMBER 16, 1968

REPORTS 3RD-QUARTER 1968 EXPOSURE OF 4.45 REMS TO RADIOGRAPHER. NO CAUSE GIVEN.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*PERSONNEL EXPOSURE, RADIATION

32287
 RADIOGRAPHER OVEREXPOSED NOVEMBER 3, 1968
 CONAM INSPECTION CORP.
 5 PAGES, LETTER TO AEC-COMPLIANCE, NOVEMBER 29, 1968

SUNDAY EXPOSURE NEAR FT. MADISON, IOWA. RADIOGRAPHER CRANKED SOURCE OUT AFTER LAST EXPOSURE UNTIL IT HIT HARD AND STOPPED. HE DID NOT MAKE A PHYSICAL SURVEY BUT PROCEEDED TO DISCONNECT SOURCE TUBE AND FOUND SOURCE STILL 3 IN. OUT OF SHIELD. HE ATTEMPTED TO PUSH IT BACK IN BY HAND, THEN CRANKED IT BACK IN. HAND EXPOSURE WAS CALCULATED AS 574 REMS. FILM BADGE READ 0.76 REM, THOUGHT TO HAVE BEEN PARTIALLY SHIELDED. *** DIVISIONAL MANAGEMENT WILL INTENSIFY REVIEW OF DAILY REPORTS AND MONITOR OPERATIONS. MANAGEMENT WILL REVIEW ENTIRE RADIATION SAFETY PROGRAM, USE MORE STRINGENT QUALIFICATION TESTS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545, (\$0.25 CENTS/PAGE)

*INCIDENT, EXPOSURE + *FAILURE, OPERATOR ERROR + SAFETY REVIEW + PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + SURVEY + CERTIFICATION

32288
RADIOGRAPHY NONCOMPLIANCE
U.S. ATOMIC ENERGY COMMISSION
6 PAGES, LETTER TO J. VANCIL, CONAM INSPECTION, DECEMBER 30, 1968

INSPECTIONS NOV. (FT. MADISON, IOWA), AUGUST (NEW JERSEY), AND OCT. (TULSA), INDICATES 18 ITEMS OF NONCOMPLIANCE. YOUR LICENSE RENEWAL APPLICATION, BEING EVALUATED BY DMC, SHOWS A NUMBER OF UNRESOLVED QUESTIONS ON IMPLEMENTATION OF PROCEDURES AND ON RELATIONSHIPS WITH PARENT COMPANY. *** ITEMS INCLUDE USUAL ONES FOR NOT SURVEYING AFTER EACH EXPOSURE, POOR RECORD KEEPING. ALSO, NOT PROCESSING FILM BADGE ON FINDING DOSIMETER DISCHARGED, NOT NOTIFYING AEC IMMEDIATELY UPON A 574-REM HAND EXPOSURE, DOSIMETERS NOT RECHARGED EACH SHIFT, USING UNTRAINED RADIOGRAPHER, SURVEY METERS CALIBRATED ON ONLY 2 SCALES.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545, (\$0.25 CENTS/PAGE)

TRAINING + RADIATION SAFETY AND CONTROL + FAILURE, ADMINISTRATIVE CONTROL

35259
OVEREXPOSURE FROM 165 KV X-RAY EQUIPMENT
CONAM INSPECTION, INC.
2 PAGES, LETTER TO DIRECTOR, DIVISION OF COMPLIANCE, USAEC, APRIL 1, 1969

ON JAN. 15, 1969, NOTIFICATION OF OVEREXPOSURE TO TWO EMPLOYEES (5.700 AND 4.14 REMS) WAS RECEIVED. BOTH EMPLOYEES WERE RELEASED FROM EMPLOYMENT ON DEC. 16, 1968. ALL ATTEMPTS TO GAIN INFORMATION ON OVEREXPOSURE HAVE BEEN IGNORED BY ONE EMPLOYEE, AND HE WILL NOT BE RETURNED TO ACTIVE EMPLOYMENT UNLESS SATISFACTORY EXPLANATION IS RECEIVED. OTHER EMPLOYEE WAS REEMPLOYED ON FEB. 17, 1969, BUT STATED THAT HE KNEW OF NO WAY BY WHICH HE COULD HAVE RECEIVED OVEREXPOSURE, BECAUSE DOSIMETER DID NOT INDICATE SUCH A READING. EMPLOYEE WAS WARNED THAT ADDITIONAL EXPOSURE OF THIS MAGNITUDE WOULD BE CAUSE FOR DISMISSAL.

USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*HEALTH PHYSICS TRAINING + FAILURE, OPERATOR ERROR + FAILURE, INSTRUMENT + *PERSONNEL EXPOSURE, RADIATION + *X-RAY + *FAILURE, ADMINISTRATIVE CONTROL

41568
CORRECTIVE ACTION TAKEN FOR NONCOMPLIANCE WITH BYPRODUCT MATERIAL LICENSE
CONAM INSPECTION, INC., OKLAHOMA
22 PAGES, FIGURES, LETTER - CONAM INSPECTION, INC. TO AEC DIVISION OF COMPLIANCE - JANUARY 23, 1969

RESPONSE GIVEN FOR NONCOMPLIANCE ITEMS CITED IN AEC LETTER OF DEC. 30, 1968. ITEMS INCLUDE (1) RADIOGRAPHER FAILED TO MAKE SURVEY AFTER OPERATION BECAUSE IT WAS 3 AM (HE WAS IN A HURRY TO GET HOME AND FORGOT), (2) USE OF DEVICE NOT AUTHORIZED BY LICENSE, (3) DAILY RECORDING OF DOSIMETER DOSAGES WERE NOT MADE, (4) USE OF SURVEY INSTRUMENTS WHICH WERE BEYOND CALIBRATION DATES, AND (5) FAILURE TO KEEP RADIATION RECORDS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, OPERATOR ERROR + *FAILURE, ADMINISTRATIVE CONTROL

35260
PERSONNEL EXPOSURE FROM IR-192 AND CO-60 SOURCES
CONAM INSPECTION, INC.
1 PAGE, LETTER TO DIRECTOR, DIVISION OF COMPLIANCE, USAEC, APRIL 1, 1969

EMPLOYEE RECEIVED DOSE OF 3.26 REM FROM 100 CURIE IR-192 AND 67 CURIE CO-60 SOURCES DURING FINAL QUARTER OF 1968, AT NOTIFICATION DATE (JANUARY 29, 1969), EMPLOYEE SAID THAT AT NO TIME DURING PERIOD HAD HIS DOSIMETER INDICATED SUCH AMOUNTS. EMPLOYEE BECAME ELIGIBLE FOR ADDITIONAL OCCUPATIONAL DOSE OF 3.00 REM AND WAS INSTRUCTED TO CONTINUE SAFE OPERATING PROCEDURES AND THERE HAS BEEN NO REPEAT OF OVEREXPOSURE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

COBALT + *HEALTH PHYSICS TRAINING + PERSONNEL PROTECTIVE DEVICE + FAILURE, INSTRUMENT + INDIUM + *PERSONNEL EXPOSURE, RADIATION + *FAILURE, ADMINISTRATIVE CONTROL

38077
EMPLOYEES FILM BADGE INDICATED OVEREXPOSURE FOR FEBRUARY 1969
CONAM INSPECTION, INC.
2 PAGES, LETTER TO C. E. EASON, DIVISION OF COMPLIANCE, AUGUST 4, 1969

AN EMPLOYEE, DOING RADIOGRAPHY WITH AN IR-192 SOURCE, LEFT HIS FILM BADGE IN POCKET OF COAT HANGING IN EXPOSURE ROOM. INDIVIDUAL DOSIMETER DID NOT SHOW AN OVEREXPOSURE. IN FUTURE THE EMPLOYEE WILL USE A PLASTIC HOLDER CONTAINING BOTH FILM BADGE AND DOSIMETER. ***FILE-CARD SYSTEM IS BEING INSTITUTED TO EXPEDITE QUARTERLY FILM-BADGE REPORTING.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

38077 *CONTINUED*
DOSE MEASUREMENT, EXTERNAL + *PERSONNEL EXPOSURE, RADIATION + *IRIDIUM + FAILURE, ADMINISTRATIVE CONTROL

40747
UNEXPLAINED HIGH FILM BADGE READING ACQUIRED DURING RADIOGRAPHY
U.S. AEC, DIVISION OF COMPLIANCE
1 PAGE, LETTER - DIVISION OF COMPLIANCE TO CONAM INSPECTION, INC. - DECEMBER 1, 1969

THE FILM BADGE OF AN EMPLOYEE OF CONAM INSPECTION, INC., INDICATED AN EXPOSURE OF 133 REMS FOR JULY. A THOROUGH INVESTIGATION, INCLUDING HOSPITALIZATION AND EXAMINATION OF THE EMPLOYEE, DID NOT EXPLAIN HIGH READING. FILM BADGE HAD BEEN DROPPED IN WORK AREA WHILE IR-192 SOURCE WAS EXPOSED. ***ANOTHER EMPLOYEE RECEIVED MORE THAN 3 REMS WHEN TOLD BY A TECHNICIAN THAT SOURCE WAS STORED IN SHIELD.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION + *IRIDIUM

04799
RADIATION EXPOSURE FROM X-RAY
CONAM INSPECTION, INC., TULSA, OKLAHOMA
5 PAGES, LETTER - CONAM INSPECTION TO DIVISION OF COMPLIANCE (AEC) - SEPTEMBER 4, 1970

WHILE REPAIRING A 170-KV X-RAY UNIT A SHORT TURNED THE MACHINE ON CAUSING A 7.4 REM EXPOSURE TO THE REPAIRMAN WHO WAS THREE FEET FROM THE PRIMARY BEAM. HIS ASSISTANT RECEIVED 1.82 REMS. THE EXPOSURE WAS REVEALED BY FILM BADGE. THE MAN FAILED TO REPORT THAT HIS DOSIMETER WENT OFF SCALE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + *X-RAY + FAILURE, OPERATOR ERROR + FAILURE, EQUIPMENT + ELECTRICAL CONDUCTION + FAULT

63793
EMPLOYEES EXPOSED TO IRIIDIUM SOURCE
U. S. ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
LETTER TO DIVISION OF COMPLIANCE FROM CONAM INSPECTION, INC. +. 4 PAGES, FEBRUARY 5, 1971

A RADIOGRAPHER RECEIVED A 13-REM EXPOSURE AND TWO OTHERS RECEIVED 0.57 AND 0.87 REM EXPOSURES WHEN THEY ENTERED THE SHOOTING VAULT TO MAKE A SETUP. INVESTIGATION REVEALED THAT THE SOURCE HAD NOT BEEN FULLY WITHDRAWN IN TO THE SHIELDED POSITION. THE MATTER WAS NOT REPORTED UNTIL THE NEXT DAY. THE SURVEY BEFORE ENTERING THE VAULT HAD BEEN MADE FROM A PARTIALLY SHIELDED POSITION. THE RADIOGRAPHER WILL BE RETRAINED AND TESTED BEFORE CONTINUING THIS TYPE WORK. AEC CITED FOUR VIOLATIONS, INCLUDING FREQUENCY OF DOSIMETER READING, SLOW PROCESSING OF FILM BADGE. ALSO, THE COMPANY WAS USING AN UNAPPROVED SOURCE-EXPOSURE DEVICE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

MONITOR, PERSONNEL + TRAINING + *PERSONNEL EXPOSURE, RADIATION + *SOURCE MECHANISM + RADIATION EXPOSURE, FRACTIONAL + SOURCE, RADIATION + FAILURE, OPERATOR ERROR

63799
PERSONNEL TRAINING AFTER EXPOSURE
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
LETTER TO DIVISION OF REACTOR COMPLIANCE FROM CONAM INSPECTION +. 3 PAGES, APRIL 26, 1971

AFTER AN EMPLOYEE RECEIVED 13 REMS, THE THREE PERSONS INVOLVED WERE REINSTRUCTED IN RADIATION SURVEYS, SURVEY RECORDS, AND PERSONNEL MONITORING CONTROL. ONE HAS SINCE BEEN TERMINATED, THE OTHERS HAVE HAD NO RECURRENCES. *** AN UNAPPROVED SOURCE TUBE WAS WITHDRAWN FROM SERVICE PENDING APPROVAL BY AEC.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

FAILURE, OPERATOR ERROR + LICENSE STATUS + MONITOR, PERSONNEL + *PROCEDURES AND MANUALS + *PERSONNEL EXPOSURE, RADIATION + OPERATING EXPERIENCE + TRAINING

26372
RADIOGRAPHY EXPOSURE AT CONSOLIDATED X-RAY SERVICE CORP.
CONSOLIDATED X-RAY SERVICE CORPORATION, DALLAS, TEXAS
2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM J.E. WRIGHT, DEC. 17, 1965

AT MIDNIGHT ON DECEMBER 4, 1965, FOLLOWING AN EXPOSURE, THE SOURCE DID NOT RETURN TO THE CAMERA. AN ASSISTANT RADIOGRAPHER COILED THE SNORKLE WITH THE END CONTAINING THE SOURCE ABOUT 2 FT FROM HIS HAND, WALKED TO A DITCH, THEN SET UP FOR ANOTHER EXPOSURE. AFTER WALKING OUT OF THE

26372 *CONTINUED*

RADIATION FIELD, IT WAS DISCOVERED THAT THE SOURCE WAS NOT SHIELDED. COPIES OF A COMPILATION OF INCIDENTS WERE SENT TO ALL EMPLOYEES TO EMPHASIZE NECESSITY OF PROPER SURVEYS.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

SOURCE, RADIATION + *PERSONNEL EXPOSURE, RADIATION + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR

25348

FLETCHER FR

DELIBERATE EXPOSURE OF RADIOGRAPHY FILM BADGE

CRANE COMPANY

2 PAGES, ATOMIC ENERGY CLEARING HOUSE, 14(21), PAGE 16-17 (MAY 20, 1968)

(LETTER, MARCH 15, INCLUDING A HEALTH PHYSICS ASSOCIATES LTD. REPORT) A FILM BADGE FOR THE WEEK OF FEB. 19-23, 1968, RECORDS A PARTIAL EXPOSURE TO THE FILM OF 36.25 R, AT 100 KEV. THE ROUND, SHARP FIELD WAS DUPLICATED BY HOLDING A BADGE AT THE TUBE BEAM PORT OF THE 250-KVP X-RAY MACHINE. THE EMPLOYEE WAS ABSENT WED. OF THAT WEEK. FURTHER QUESTIONING MAY ARRIVE AT THE ANSWER. OUR OPINION IS THAT THE BADGE WAS DELIBERATELY EXPOSED. OUR RECOMMENDATION IS TO LOCK UP ALL BADGES NOT IN USE.

*FAILURE, OPERATOR ERROR + PERSONNEL PROTECTIVE DEVICE + PERSONNEL EXPOSURE, RADIATION + *X-RAY

34865

RADIOGRAPHER RECEIVES ESTIMATED 25.19 R EXPOSURE

U.S. ATOMIC ENERGY COMMISSION + CRANE COMPANY

15 PAGES, LETTERS - AEC AND CRANE COMPANY- JANUARY 22, 1969, MARCH 25, 1969

ON JANUARY 8, 1969 A RADIOGRAPHER WAS EXPOSED TO A 43 CURIE IR-192 SOURCE AT VARYING DISTANCES BETWEEN 4-00 AND 6-30 A.M. HE WAS RADIOGRAPHING STEEL CASTINGS INSIDE A SHIELDED CELL, WHICH HAD A SINGLE SOURCE TUBE THAT COULD BE CONNECTED TO EITHER OF TWO SOURCES (43 AND 11 CURIES) IN SEPARATE SHIELDS (T.O. 402 AND T.O. 412). AT 4-00 A.M. HE USED THE 43 CURIE SOURCE AND PLACED THE FILM IN A AUTOMATIC DEVELOPER. HE CHANGED THE SOURCE TUBE FROM THE T.O. 402 TO THE T.O. 412 (DISCONNECTING THE LAST 6 FT 6 IN. SECTION FROM ONE UNIT AND CONNECTING IT TO THE OTHER) MADE EXPOSURES AND NOTED THE FILM WAS TOO DARK. HE NOTICED THE SURVEY METER ON THE CONTROL STATION WAS UPSCALE ON THE 0-10 MR/HR SCALE AND CALLED HIS SUPERVISOR. SINCE THE CONTROL LIGHTS SHOWED BOTH SOURCES IN SAFE POSITIONS BUT HIGH RADIATION WAS PRESENT, MANUFACTURER WAS CALLED. THE 43 C SOURCE WAS STUCK 18 IN. FROM THE SHIELD. THE EMPLOYEE WAS NOT AUTHORIZED BY AEC TO BE A RADIOGRAPHER, WAS NOT WEARING A FILM BADGE OR DOSIMETER, DID NOT USE THE SURVEY METER FOLLOWING SOURCE RETRACTION, AND THE GAMMA RADIATION MONITOR FOR THAT CELL WAS BEING CALIBRATED AND WAS NOT YET INSTALLED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (\$0.25 CENTS/PAGE)

CONTROL SYSTEM + FAILURE, EQUIPMENT + HCT CELL + FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION + *FAILURE, ADMINISTRATIVE CONTROL + MONITOR, AREA + CERTIFICATION

35258

DENIAL OF LEAKY SOURCE

CUMBERLAND RESEARCH CORP.

1 PAGE, LETTER TO DIRECTOR, DIVISION OF MATERIAL LICENSING, USAEC, APRIL 22, 1969

ON MARCH 21, 1969, PUGET SOUND NAVAL SHIPYARD REPORTED A POTENTIALLY LEAKING IR-192 SOURCE. IT WAS RECEIVED AT THE PLANT ON APRIL 18, 1969, AND A SWAB OF SOURCE-CABLE ASSEMBLY ON APRIL 21, 1969, SHOWED 0.3 NANOCURIES OF REMOVABLE CONTAMINATION. QUALITY-CONTROL PROCEDURES WERE IMPROVED TO PREVENT FUTURE EXCESS CONTAMINATION

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

CONTAINMENT, SOURCE + *SOURCE, RADIATION + TEST, LEAK RATE + *CONTAMINATION + IRIIDIUM + *QUALITY ASSURANCE + *LEAK

40444

RADIOGRAPHER RECEIVES OVEREXPOSURE

DAYTON X-RAY COMPANY

3 PAGES, LETTER - DAYTON X-RAY CORPORATION TO AEC DIVISION OF COMPLIANCE - OCTOBER 20, 1969

ON OCT. 9, 1968, RADIOGRAPHER FAILED TO CRANK SOURCE COMPLETELY BACK INTO ITS CONTAINER AND ALSO FAILED TO MAKE A SURVEY. THE FOLLOWING MORNING HE AGAIN ENTERED ROOM AND AGAIN FAILED TO SURVEY. SECOND RADIOGRAPHER OBTAINED METER, PERFORMED SURVEY, AND ASSISTED IN RETURNING SOURCE TO CONTAINER. FILM BADGE INDICATED RADIOGRAPHER HAD RECEIVED AN EXPOSURE OF 1.18 R. TOTAL EXPOSURE FOR QUARTER WAS 1.42 R.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

INCIDENT, EXPOSURE + FAILURE, OPERATOR ERROR + SOURCE, RADIATION + *PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + INCIDENT, HUMAN ERROR

32634
1 CURIE CS-137 LOST IN WELL
DRESSER ATLAS
3 PAGES, LETTER TO J. WARD, DENVER COMPLIANCE, JANUARY 21, 1969

SOURCE LOST DEC. 10, 1968, AT 1050 FT NEAR WASHAKIE COUNTY, WYOMING. ON DEC. 15, SOURCE WAS LOCATED AT 9258 FT, AND WELL WAS PLUGGED WITH 600 SACKS OF CEMENT. ATTACHED DIAGRAM SHOWS WELL PRODUCTION IS FROM 10,940-10,972 FT.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545, (\$0.25 CENTS/PAGE)

*SOURCE, RADIATION, LCST

35764
PERSONNEL OVEREXPOSURE DURING RADIOGRAPHY
DRESSER ATLAS
2 PAGES, LETTER TO DIRECTOR, DIVISION OF COMPLIANCE, USAEC, FROM J.C. WILSON, MARCH 6, 1969

INDIVIDUAL USING A 7-CURIE CS-137 DENSIOLOG AND A 0.3-GRAM RA-BE NEUTRON SOURCE AT HOBBS, N.M. RECEIVED EXPOSURE OF 650 MR (GAMMA) FOR DECEMBER 1968 AND TOTAL OF 1520 MR FOR FOURTH QUARTER OF 1968. DISCUSSION OF SOURCE-HANDLING TECHNIQUES WITH INDIVIDUAL, AND EQUIPMENT MODIFICATION TO ELIMINATE USE OF RA-BE SOURCE IS EXPECTED TO MINIMIZE FUTURE EXPOSURE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

BERYLLIUM + CESIUM + FAILURE, OPERATOR ERROR + *SOURCE, NEUTRON + *SOURCE, RADIATION + RADIUM + *PERSONNEL EXPOSURE, RADIATION + SPECIAL NUCLEAR MATERIAL

61442
AM-BE SOURCE LOST BY DRESSER ATLAS IN A WELL
DRESSER ATLAS, HOUSTON, TEXAS
2 PAGES, LETTER - DRESSER ATLAS TO DIVISION OF COMPLIANCE (AEC) - JANUARY 11, 1971

A 5 CI AM-BE SOURCE STUCK IN A WELL ON DEC. 6, 1970. WHILE ATTEMPTING TO REMOVE THE SOURCE, ITS CABLE BROKE. REPEATED ATTEMPTS WERE MADE TO LOCATE AND REMOVE THE SOURCE. IT WAS NOT LOCATED AND IS BELIEVED TO BE AT THE BOTTOM OF THE WELL. NO OTHER RECOVERY ATTEMPTS WILL BE MADE. A PLAQUE WILL BE PLACED AT THE WELL.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

FAILURE, EQUIPMENT + *SOURCE, RADIATION, LCST

48236
AEC INVESTIGATES RADIOGRAPHY INCIDENT
U.S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE
4 PAGES, LETTER - DIVISION OF COMPLIANCE (AEC) TO DUKE POWER COMPANY, MAY 8, 1968

RADIOGRAPHER FAILED TO MAKE AN ADEQUATE EVALUATION OF THE RADIATION DOSE HE WAS LIKELY TO RECEIVE ON FEBRUARY 20, 1968, WHILE RETURNING A 91-CURIE IRIIDIUM-192 SOURCE TO ITS SHIELDED CONDITION IN A RADIOGRAPHIC DEVICE AFTER THE SOURCE WAS FOUND TO BE DISCONNECTED IN THE EXPOSURE TUBE. AS A RESULT, THE RADIOGRAPHER RECEIVED AN EXPOSURE TO HIS RIGHT HAND OF ABOUT 800 REMS AND A WHOLE-BODY EXPOSURE OF ABOUT 2.96 REMS. NO EVALUATION WAS MADE TO DETERMINE THE EXTENT OF PERSONNEL EXPOSURE, WHEN IT WAS KNOWN THAT THE DOSIMETERS WORN BY THE RADIOGRAPHER AND HIS ASSISTANT HAD GONE OFF SCALE. INDIVIDUAL WAS PERMITTED TO ACT AS A RADIOGRAPHER WITHOUT RECEIVING INSTRUCTIONS IN THE SUBJECTS OUTLINED IN APPENDIX A OF 10 CFR 34 AND WITHOUT DEMONSTRATING AN UNDERSTANDING OF THOSE SUBJECTS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + *FAILURE, OPERATOR ERROR + *FAILURE, ADMINISTRATIVE CONTROL

32281
RADIOGRAPHER EXPOSURE DUE TO IMPROPER SURVEY
DURALOY COMPANY
1 PAGE, LETTER TO R.E. CUNNINGHAM, AEC-CML, NOVEMBER 21, 1968

FOLLOWING A 35-MIN EXPOSURE OCT. 23, THE RADIOGRAPHER FORGOT TO CRANK THE SOURCE BACK AND ENTERED THE HIGH RADIATION AREA ROOM WITH THE SURVEY METER ON BUT WITH THE EARPHONES TURNED OFF. HE DID NOT RECOGNIZE THE FACT THAT THE NEEDLE WAS PEGGED WHEN HE CHECKED THE METER, AND STAYED IN THE IMMEDIATE AREA OF THE 9.25-CURIE IR-192 SOURCE FOR 7 MIN TO REPLACE FILM. *** BADGE WAS WORN IN SUCH A WAY AS TO BE SHIELDED BY HIS BODY. REENACTMENT SHOWS ABOUT 34 R TO HANDS AND ABOUT 5 R TO WHOLE BODY.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545, (\$0.25 CENTS/PAGE)

*INCIDENT, EXPOSURE + *FAILURE, OPERATOR ERROR + PERSONNEL PROTECTIVE DEVICE + TRAINING + SURVEY, RADIATION +

32281 *CONTINUED*
DOSE CALCULATION, EXTERNAL + PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL

41566
NONCOMPLIANCE WITH BYPRODUCT MATERIAL LICENSE
AEC, DIVISION OF COMPLIANCE
2 PAGES, LETTER - AEC DIVISION OF COMPLIANCE TO DURIRON COMPANY - JANUARY 29, 1969

INVESTIGATION OF INCIDENT INVOLVING RADIOGRAPHIC OPERATIONS ON OCT. 7, 1968, REVEALED (1) RADIOGRAPHER FAILED TO REAC POCKET DOSIMETER AND THEN RECORD DOSE AFTER PERFORMING OPERATION, AND (2) ENTRIES WERE MADE INTO GAMMA ROOM ON OCT. 8 WITHOUT PERFORMING A RADIATION SURVEY. ATTACHED LETTER FROM COMPANY DATED NOV. 15, 1968, DESCRIBES INCIDENT IN WHICH SOURCE BECAME DISLODGED FROM SOURCE TUBE CONNECTION. NO DOSES GIVEN.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

INCIDENT, EXPOSURE + *FAILURE, EQUIPMENT + *FAILURE, OPERATOR ERROR + PERSONNEL EXPOSURE, RADIATION

35183
RESPONSE TO JAN. 29, 1969 CITATION FOR RADIOGRAPHY NON-COMPLIANCE
DURIRON COMPANY
5 PAGES, LETTER TO L.C. LOW, USAEC, MARCH 17, 1969

AS RESULT OF AEC INVESTIGATION OF OCTOBER 9 AND 10, 1968, FOLLOWING ACTION WAS TAKEN - (1) DOSIMETER READINGS ARE RECORDED FIVE TIMES PER DAY (AT 8-10-1 AND 3 O CLOCK AND AT COMPLETION OF RADIOGRAPHIC OPERATIONS). (2) ACQUIRED TWO ADDITIONAL SURVEY METERS FOR GAMMA ROOM FOR BETTER RELIABILITY. (3) SURVEYS OF SOURCE TUBE AND CONTAINER ARE MADE AND RECORDED AS SEPARATE ITEMS IN ADDITION TO GAMMA-ROOM SURVEY ON ENTRY TO ROOM. (4) IN ADDITION TO EXISTING INTERLOCKING LIGHTS, A GA-25 GAMMA ALARM SYSTEM WAS INSTALLED TO APPRISE PERSONNEL UPON ENTRY TO GAMMA ROOM THAT CO-60 SOURCE IS PROPERLY SECURED IN SHIELD. (5) EXISTING PROCEDURES WILL BE AMENDED TO REFLECT CORRECTIVE ACTION TAKEN.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

CORALIT + *PERSONNEL PROTECTIVE DEVICE + PROCEDURES AND MANUALS + SOURCE, RADIATION + INSTRUMENT, INTERLOCK + RADIOISOTOPE + *GAMMA EMITTER + MONITOR, AREA

00551
NON COMPLIANCE WITH STANDARDS FOR RADIATION PROTECTION
U.S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE
2 PAGES, LETTER - DIVISION OF COMPLIANCE (AEC) TO EASTERN INSPECTION, INC. - JUNE 23, 1970

AN INSPECTION REVEALED THE FOLLOWING DEFICIENCIES - (1) NO EVALUATION OF ACTUAL EXPOSURE AFTER A HIGH INDICATED EXPOSURE. (2) QUARTERLY INVENTORIES DID NOT SHOW QUANTITY OF BY-PRODUCT MATERIAL POSSESSED. (3) NO FILM BADGE WORN BY A RADIOGRAPHERS. (4) RADIOGRAPHERS TEST RESULTS NOT REPORTED, AND MONTHLY FIELD INSPECTIONS WERE NOT CONDUCTED. (5) RADIOGRAPHY AT AN UNAUTHORIZED LOCATION. (6) BY-PRODUCT MATERIAL STORED AT AN UNAUTHORIZED LOCATION. THE COMPANY RESPONSE IS INCLUDED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + *FAILURE, ADMINISTRATIVE CONTROL + FAILURE, OPERATOR ERROR + *RECORDS + RADIATION EXPOSURE, RECORD KEEPING + MONITOR, PERSONNEL

63358
EASTERN INSPECTION, INC. CITED FOR NONCOMPLIANCE
EASTERN INSPECTION, INC. CANTON, OHIO
7 PAGES, LETTER FROM DIVISION OF COMPLIANCE (USAEC) TO EASTERN INSPECTION, INC., APRIL 12, 1971

FIVE ITEMS OF NONCOMPLIANCE NOTED. TWO EXAMPLES ARE - (1) CONTRARY TO 10 CFR 34.43(B), RADIATION SURVEYS AND SURVEY RECORDS, RADIOGRAPHIC PERSONNEL WORKING AT THE CHEVRON OIL COMPANY PLANT, PERTH AMBOY, NEW JERSEY, ON AUGUST 10 AND 11, 1970, DID NOT MAKE A PHYSICAL RADIATION SURVEY AFTER EACH RADIOGRAPHIC EXPOSURE TO DETERMINE THAT THE SEALED SOURCE HAD BEEN RETURNED TO ITS SHIELDED CONDITION. AS A RESULT, ONE EMPLOYEE RECEIVED A RADIATION DOSE IN EXCESS OF AEC LIMITS. CONTRARY TO 10 CFR 20.201(B), SURVEYS, AN ADEQUATE SURVEY WAS NOT MADE TO DETERMINE THE FULL EXTENT OF RADIATION EXPOSURES RECEIVED BY TWO EMPLOYEES DURING RECOVERY OF AN IRIIDIUM 192 SOURCE AFTER IT BECAME LODGED IN THE GUIDE TUBE OF A RADIOGRAPHIC EXPOSURE DEVICE ON AUGUST 11, 1970, DURING RADIOGRAPHIC OPERATIONS AT PERTH AMBOY, NEW JERSEY. NO EVALUATION WAS MADE TO DETERMINE THE RADIATION DOSES THE INDIVIDUALS MAY HAVE RECEIVED TO THEIR EXTREMITIES DURING THE RECOVERY OPERATIONS AND TO ASCERTAIN WHETHER THE FILM BADGE READINGS FOR THE EXPOSED PERSONS WERE INDICATIVE OF THE ACTUAL WHOLEBODY DOSES RECEIVED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*EMERGENCY PROCEDURE + PERSONNEL EXPOSURE, RADIATION + RADIATION EXPOSURE, RECORD KEEPING

15079
RADIOGRAPHY EXPOSURE AT EASTERN TESTING AND INSPECTION INC., DEC. 31, 1966
EASTERN TESTING AND INSPECTION, INC.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 13(11), PAGE 33, (MARCH 13, 1967)

ON FEB. 7, EASTERN TESTING AND INSPECTION REPORTED THAT A FORMER EMPLOYEE HAD CHECKED INTO A HOSPITAL WITH RADIATION BURNS ON THE LEFT HAND. CALCULATIONS INDICATED 600 R TO THE FINGERS AND 2 R TO THE BODY, AS THE EMPLOYEE CHANGED THE POSITION OF THE UNSHIELDED SOURCE WITH HIS HANDS. HE DID NOT CHECK THE SOURCE-POSITION LIGHTS, DID NOT USE A SURVEY METER, AND LEFT HIS FILM BADGE ON HIS COAT.

*FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION + *INCIDENT, HUMAN ERROR

42879
83-CURIE COBALT-60 SOURCE BEING USED IN RADIOGRAPHY DEVICE DESIGNED FOR 50-CURIE COBALT-60 SOURCE
AEC, DIVISION OF COMPLIANCE
1 PAGE, LETTER FROM DIVISION OF COMPLIANCE (AEC) TO EASTERN TESTING AND INSPECTION INC., FEBRUARY 19, 1970

DURING INSPECTION CONDUCTED 12-08-69, EASTERN TESTING AND INSPECTION WAS USING 83-CURIE COBALT-60 SOURCE FROM TECHNICAL OPERATION IN A TECHNICAL OPERATIONS RADIOGRAPHY DEVICE DESIGNED FOR 50 CURIES OF COBALT-60. A LICENSE APPLICATION FOR SUCH A DEVICE HAS NOT YET BEEN RECEIVED. THIS IS NECESSARY TO ENSURE CONTINUED COMPLIANCE WITH PROVISIONS OF EXISTING LICENSE.

AVAILABILITY - USAEC PUBLIC DOCUMENT RCCM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*COBALT + SOURCE, RADIATION + *FAILURE, ADMINISTRATIVE CONTROL

15080
RADIOGRAPHY EXPOSURE AT ERIE FORGE AND STEEL CORP., JAN. 10, 1967
ERIE FORGE AND STEEL CORP.
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(11), PAGES 33-34, (MARCH 13, 1967)

ON FEB. 7, ERIE FORGE AND STEEL REPORTED AN EXPOSURE OF 4472 R (HARD GAMMA) AS A RADIOGRAPHER ATTEMPTED TO PLUG THE STORAGE SAFE AT THE END OF THE WORK. HE FOUND THE SOURCE 5 IN. FROM THE OPENING AND THEN LEFT. AFTER SEVERAL TRIALS, THE SOURCE WAS FULLY RUN IN. SILT AND DIRT CAUSED THE TROUBLE. THE TECHNICIAN USED A SURVEY METER (APPARENTLY INEFFECTIVE BECAUSE OF GEOMETRY). SOURCE-POSITION INDICATING LIGHTS WERE INEFFECTIVE BECAUSE OF CONTROL-BOX MODIFICATIONS. BLOOD TESTS SHOWED NO IRREGULARITIES.

MAINTENANCE AND REPAIR + *INCIDENT, EQUIPMENT + PERSONNEL EXPOSURE, RADIATION + *FAILURE, MAINTENANCE ERROR + *INSTRUMENT, POSITION

26343
COMPLIANCE WITH RADIOGRAPHIC-MATERIAL STORAGE REGULATIONS
FARRELL-CHEEK STEEL COMPANY, SANDUSKY, OHIO
4 PAGES, LETTER TO R.G. PAGE, AEC DIVISION OF LICENSING AND REGULATION FROM G.L. WRIGHT, OCTOBER 28, 1963

STEPS TAKEN TO COMPLY WITH AEC STANDARDS INCLUDE (1) INSTALLATION OF A DETECTION DEVICE ENERGIZED AS SOURCE LEAVES STORAGE SAFE, WHICH ACTUATES FLASHING LIGHTS AND LATCHER GATE TO RADIATION ROOM, AND (2) A REQUEST FOR EXEMPTION FROM INSTALLING A CONTROL DEVICE ON THE ROOF SINCE A 4-FT-HIGH FENCE EXISTS WITH WARNING SIGNS, NO LADDERS TO ROOF EXIST, AND FLASHING RED LIGHTS WERE INSTALLED ON THE FENCE.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

ADMINISTRATIVE CONTROL + INSTRUMENT, RADIATION MONITORING + SOURCE, RADIATION + *RADIATION SAFETY AND CONTROL + *STORAGE CONTAINER + *MONITOR, AREA

26312
AEC CITATION FOR DEFICIENCIES IN RADIOGRAPHY OPERATIONS
UNITED STATES ATOMIC ENERGY COMMISSION
2 PAGES, LETTER TO FOSTER WHEELER CORPORATION FROM E.R. PRICE, NOVEMBER 6, 1963

AN AEC INSPECTION ON AUGUST 29, 1963, RESULTED IN A CITATION FOR (1) PERMITTING EMPLOYEES TO PERFORM RADIOGRAPHY BEFORE COMPLETING THE TRAINING COURSE, (2) FAILING TO INCLUDE IN REPORTS OF RADIATION EXPOSURE TO FORMER EMPLOYEES THE STATEMENTS THAT THE REPORT WAS FURNISHED UNDER PROVISIONS OF AEC REGULATIONS AND SHOULD BE PRESERVED FOR FUTURE REFERENCE, AND (3) FAILING TO LABEL A SOURCE CONTAINER.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

SOURCE, RADIATION + TRAINING + *RADIATION SAFETY AND CONTROL + *FAILURE, ADMINISTRATIVE CONTROL

48238
RADIOGRAPHERS RECEIVE OVEREXPOSURE (CO-60)
FOSTER-WHEELER CORPORATION

48238 *CONTINUED*
1 PAGE, TELEGRAM - FOSTER-WHEELER CORPORATION TO DIVISION OF COMPLIANCE (AEC) - MAY 3, 1968

AS A RESULT OF A 10-CURIE COBALT-60 SOURCE CAPSULE PARTING FROM THE CABLE, THE CAPSULE WAS UNSHIELDED FOR 3 TO 4 HRS UNKNOWN TO RADIOGRAPHERS IN THE AREA. IT IS ESTIMATED THAT RADIOGRAPHERS COULD HAVE RECEIVED RADIATION DOSAGES FROM 5R TO 15R. FILM BADGE RESULTS HAVE BEEN AIR MAILED FOR PROCESSING.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + *FAILURE, EQUIPMENT

31543
REPORT OF RADIATION EXPOSURE, MOUNTAINTCP PA.
FOSTER-WHEELER CORPORATION
9 PAGES, 1 FIGURE, LETTER TO DL AND R, MAY 28, 1968

THE DAY SHIFT ON MAY 2 HAD DIFFICULTY CRANKING OUT SOURCE. EVENING SHIFT CHANGED CONTROL CABLE, THEN STRAIGHTENED BENDS IN SOURCE TUBE, FINALLY CHANGED SOURCE TUBE. RADIATION READINGS LOOKED ODC, BUT SOURCE PIGTAIL WAS IN SHIELD. WHEN NEWS OF BLANK FILM CAME, SECOND SOURCE CRANKED OUT, SURVEYED, AND FOUND NO RADIATION PRESENT. *** LATER, THE SOURCE, SEPARATED FROM PIGTAIL, WAS FOUND IN SECOND SOURCE TUBE, WHICH HAD BEEN PLACED BEHIND NATURAL SHIELDING. REENACTMENT SHOWED THAT THOSE WHO CARRIED SOURCE TUBES RECEIVED 240 AND 120 REMS, DESPITE FILM-BADGE READINGS OF 90 MR (NOT WORN.)

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D. C. 20545 (\$0.25 CENTS/PAGE)

*INCIDENT, EXPOSURE + FAILURE, EQUIPMENT + *FAILURE, OPERATOR ERROR + TRAINING + SURVEY, RADIATION + *PERSONNEL EXPOSURE, RADIATION + *OPERATOR ACTION

40440
LICENSE VIOLATIONS
U.S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE
2 PAGES, LETTER - AEC DIVISION OF COMPLIANCE TO FOSTER-WHEELER CORPORATION - JANUARY 8, 1969

INSPECTION CONDUCTED NOVEMBER 25 AND 26, 1969. REVEALED VIOLATIONS WHICH INCLUDED (1) USE OF SOURCE GUIDE TUBES FABRICATED BY ANACONDA COPPER, AND (2) MODIFICATION OF SOURCE GUIDE TUBES MANUFACTURED BY BUDD COMPANY. LICENSE AUTHORIZES USE OF BUDD CO. MODELS 110A AND 40AD AND TECHNICAL OPERATIONS MODELS 402 AND 533 RADIOGRAPHIC DEVICES ONLY.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*MODIFICATION + *FAILURE, ADMINISTRATIVE CONTROL + EQUIPMENT

26342
RESPONSE TO AEC CITATION FOR INFRACTION OF SOURCE-HANDLING PROCEDURES
ATOMIC ENERGY OF CANADA LTD., OTTAWA, CANADA
2 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSEE RELATIONS FROM G.E. MCCULLUM, JUNE 16, 1966

COMPANY RESPONSE INCLUDED - (1) WORKERS DID NOT WEAR DOSIMETERS BECAUSE THEY WERE UNABLE TO ZERO THEM AFTER THE CHARGER WAS DAMAGED. IN FUTURE FIELD TRIPS, EACH PERSON WILL HAND CARRY A CHARGER. (2) ALL FIELD PERSONNEL ARE NOW EQUIPPED WITH AN AUDIBLE PERSONNEL MONITOR AND FILM BADGES FOR HEAD MONITORING.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

FAILURE, OPERATOR ERROR + *INSTRUMENT, RADIATION MONITORING + *MONITOR, PERSONNEL + PERSONNEL PROTECTIVE DEVICE + *FAILURE, INSTRUMENT

26319
OVEREXPOSURE TO RADIOGRAPHER - SOURCE NOT CONNECTED TO CABLE
GENERAL DYNAMICS CORP., CONVAIR
2 PAGES, MEMORANDA ON OVEREXPOSURE, AUGUST 7, 1964

ON AUGUST 6, 1964, RADIOGRAPHER RECEIVED A DOSE OF 3.8 REMS. AFTER AN EXPOSURE, THE SOURCE WAS RETRACTED, BUT THE LIGHT INDICATING THAT THE SOURCE WAS SAFELY STORED WAS NOT RECEIVED. THE EXPOSURE DEVICE WAS OUTSIDE A TANK, WHILE THE SOURCE TUBE WAS INSIDE. WHEN THE RADIOGRAPHER FOUND HIS DOSIMETER WAS OFF SCALE, IT WAS DISCOVERED THAT THE SOURCE WAS NOT ATTACHED TO THE OPERATING CABLE. CORRECTIVE ACTION INCLUDED 3 DAYS SUSPENSION WITHOUT PAY AND A REVIEW OF THE INCIDENT AND CORRECT PROCEDURES WITH ALL RADIOGRAPHERS.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, OPERATOR ERROR + SOURCE, RADIATION + PERSONNEL EXPOSURE, RADIATION + INCIDENT, NONREACTOR

26371

26371 *CONTINUED*

RADIOGRAPHY EXPOSURE AT GENERAL DYNAMICS CORP.
 GENERAL DYNAMICS CORPORATION, GROTON, CONNECTICUT
 4 PAGES, LETTER TO AEC DIVISION OF LICENSING FROM W. GORVINE, JULY 20, 1965

RADIOGRAPHER RECEIVED A DOSE OF 4.2 REMS, AS INDICATED BY A FILM BADGE WORN ON HIS LAPEL. CALCULATIONS INDICATED A DOSE OF 9.6 REMS TO THE BODY MIDSECTION. THE SOURCE WAS NOT COMPLETELY RETRACTED AFTER AN EXPOSURE. DISCOVERY OF THE UNSAFE CONDITION WAS MADE BY A RADIATION AUDITOR DURING A ROUTINE SURVEY, WHO THEN ALERTED THE RADIOGRAPHER THAT THE CONTROL LIGHTS ON THE DEVICE WERE INDICATING THAT THE SOURCE WAS NOT RETRACTED. THE CAUSE WAS ATTRIBUTED TO FAILURE TO FOLLOW PROCEDURES AND MAKE PROPER SURVEYS.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

SOURCE, RADIATION + *PERSONNEL EXPOSURE, RADIATION + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR

11946

CLIFFORD FL
 RADIOGRAPHY OVEREXPOSURE AT ELECTRIC BOAT, SEPTEMBER 12, 1966
 GENERAL DYNAMICS CORPORATION, ELECTRIC BOAT DIV.
 2 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(42), PAGES 12-13 (OCTOBER 17, 1966)

A THREE-MAN TEAM HAD ARRANGED A SYSTEM OF CODED KNOCKS ON THE HULL, WHEREBY THE OUTSIDE MAN WOULD KNOCK WHEN THE FILM WAS IN PLACE AND HE WAS OUT OF THE WAY. HE RECEIVED 3.35 REMS (GAMMA) FROM AN IR-192 SOURCE WHEN THE INSIDE MAN THOUGHT HE HAD HEARD THE SIGNAL TO PROCEED. WORKERS WERE INSTRUCTED TO USE AUDIBLE MONITORS AND SOUND-POWERED TELEPHONES.

*FAILURE, OPERATOR ERROR + PERSONNEL EXPOSURE, RADIATION + *INCIDENT, HUMAN ERROR + *FAILURE, ADMINISTRATIVE CONTROL

26326

RADIOGRAPHY EXPOSURE AT GENERAL DYNAMICS CORP.
 GENERAL DYNAMICS CORP., GROTON, CONNECTICUT
 3 PAGES, LETTER TO AEC DIVISION OF LICENSES FROM W. GORVINE, APRIL 4, 1967

A RADIOGRAPHER RECEIVED A DOSE OF 3.51 REMS WHEN THE SOURCE WAS NOT FULLY RETRACTED INTO ITS SHIELD. BOTH THE RADIOGRAPHER AND ASSISTANT STATED THAT THE STORED LIGHT WAS ON, INDICATING REACTION. A SURVEY WAS MADE FROM THE REAR AND SIDE BUT NOT IN FRONT OF THE DEVICE. THE DEVICE WAS LOCKED AND MOVED TO A NEW POSITION. A SECOND ASSISTANT DISCOVERED THE CONDITION WHEN HE NOTED THAT HIS SURVEY METER WAS READING 5 MR/HR.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

SOURCE, RADIATION + *PERSONNEL EXPOSURE, RADIATION + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR

28851

HIRSCHBERG SM
 REPORT OF OVEREXPOSURE DURING RADIOGRAPHY
 GENERAL DYNAMICS, GROTON, CONN.
 LETTER TO DIRECTOR, DIV. OF COMPLIANCE, USAEC, WASHINGTON, D. C., MARCH 21, 1968

ON JAN. 30, 1968, A RADIOGRAPHER NOTED THAT THE DEVICE WAS OPERATING WITH DIFFICULTY AFTER 21 EXPOSURES, AND HIS DOSIMETER READ 10 MREM. AFTER 28 EXPOSURES IT WAS OFF SCALE. FILM BADGE READ 14.5 REMS. ALTHOUGH RADIOGRAPHER STATED HE SURVEYED, AND STORED LIGHT WAS RECEIVED AFTER EACH EXPOSURE, IT WAS JUDGED HE FAILED TO NOTE THESE. A CRIMPED AREA ON DRIVE HOUSING COULD RESTRICT DRIVE OPERATION. HE WAS ESTIMATED TO RECEIVE 20 REMS WHOLE BODY AND 50 REMS EXTREMITIES. *** (CITATION JULY 31) FOR NOT SURVEYING, NOT NOTIFYING SUPERVISOR, AND NOT FOLLOWING EMERGENCY PROCEDURES. AEC BELIEVES WHOLE BODY DOSE WAS FROM 50 TO 20 REMS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*INCIDENT, EXPOSURE + FAILURE, EQUIPMENT + FAILURE, OPERATOR ERROR + *EMERGENCY PROCEDURE + PERSONNEL EXPOSURE, RADIATION

26308

OVEREXPOSURE TO RADIOGRAPHER
 GENERAL DYNAMICS CORP., GROTON, CONNECTICUT
 1 PAGE, ATOMIC ENERGY CLEARING HOUSE, 14(9), PAGE 27 (FEBRUARY 26, 1968)

(TWX JANUARY 30) A RADIOGRAPHER RECEIVED A CALCULATED DOSE OF 14.5 REMS GAMMA WHILE PERFORMING OPERATIONS WITH A 96-CURIE IR-192 SOURCE.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*PERSONNEL EXPOSURE, RADIATION + INCIDENT, NONREACTOR

32413

32413 *CONTINUED*
RADIOGRAPHERS OVER EXPOSED
GENERAL DYNAMICS
1 PAGE, TWX TO REGION I COMPLIANCE, FEBRUARY 19, 1969

THREE RADIOGRAPHERS AND 1 USN OFFICER WERE EXPOSED TO AN 89-CURIE IR-192 SOURCE, RECEIVING 31, 18.5, 11, AND 6 R (ESTIMATED). REPORTS TO FOLLOW.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (\$0.25 CENTS/PAGE)

*INCIDENT, EXPOSURE + PERSONNEL EXPOSURE, RADIATION

36285
REPORT OF EXPOSURE TO IONIZING RADIATION
GENERAL DYNAMICS
4 PAGES, LETTER TO DIRECTOR, DIVISION OF COMPLIANCE, MARCH 12, 1969

FIVE PEOPLE WERE OVEREXPOSED (UP TO 31.0 REMS, WHOLE BODY) DURING RADIOGRAPHY WORK BECAUSE READING ON SURVEY METER (THOUGHT TO BE FAULTY) WERE MISINTERPRETED. 89-CURIE IR-192 SOURCES, THOUGHT TO BE STORED IN SHIELD BETWEEN RADIOGRAPHIC EXPOSURES, WERE NOT. CRIMPED SOURCE TUBE AND FAULTY POSITION LIGHT CONTRIBUTED TO PROBLEM. REFRESHER TRAINING AND REVIEW OF PROCEDURES PRESENTED TO PERSONNEL.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

HEALTH PHYSICS TRAINING + *FAILURE, OPERATOR ERROR + SOURCE, RADIATION + TRAINING + SURVEY, RADIATION + FAILURE, INSTRUMENT + *PERSONNEL EXPOSURE, RADIATION + *IRIDIUM

36284
NON COMPLIANCE CITATION FOR RADIOGRAPHY SAFETY PRACTICES
U.S. ATOMIC ENERGY COMMISSION + GENERAL DYNAMICS
2 PAGES, LETTER TO J.D. PIERCE, GENERAL DYNAMICS ELECTRIC BOAK DIVISION, APRIL 10, 1969

FOLLOWING A FEB.-MAR. INVESTIGATION OF A FEB. 19 INCIDENT, CITATION ISSUED FOR (A) INADEQUATE SURVEYING AFTER EACH RETURN OF 86-CURIE IR-192 SOURCE TO ITS SHIELD, (B) NOT READING DOSIMETERS AFTER EACH RADIOGRAPHIC EXPOSURE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*INCIDENT, EXPOSURE + FAILURE, OPERATOR ERROR + PERSONNEL PROTECTIVE DEVICE + *SURVEY, RADIATION + *IRIDIUM

36290
ACTION FOLLOWING RADIOGRAPHY CITATION
GENERAL DYNAMICS
3 PAGES, LETTER TO L.D. LOW, DIVISION OF COMPLIANCE, APRIL 30, 1969

FOLLOWING AN APRIL 10 CITATION FOR A RADIATION EXPOSURE DURING RADIOGRAPHY, A RETRAINING COURSE WAS RUN FOR ALL RADIOGRAPHY PERSONNEL, EMPHASIZING IMPORTANCE OF READING DOSIMETERS AND CAREFUL SURVEY. NOW THE CHIEF RADIATION PROTECTION OFFICER REPORTS DIRECTLY TO THE DIRECTOR OF QUALITY ASSURANCE. MOST SIGNIFICANT RESULT OF RETRAINING AND MORE RIGID CONTROL HAS BEEN IMPROVED MORALE AND ATTITUDE AMONG RADIOGRAPHERS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

HEALTH PHYSICS TRAINING + *TRAINING + *SURVEY, RADIATION

36283
RADIOGRAPHY OVEREXPOSURE AT GROTON, CONNECTICUT
GENERAL DYNAMICS CORPORATION
1 PAGE, TWX TO REGION I COMPLIANCE, JUNE 12, 1969

A RADIOGRAPHIC OPERATION OF 11 JUNE 69 EXPOSED ONE MAN TO 88 CURIES OF IR-192, GIVING HIM A 3-REM WHOLE-BODY DOSE, 1000 REMS TO RIGHT HAND, 75 TO LEFT HAND.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*INCIDENT, EXPOSURE + PERSONNEL EXPOSURE, RADIATION + *IRIDIUM

41534
INADEQUATE SURVEY RESULTS IN RADIATION EXPOSURE TO RADIOGRAPHER
GENERAL DYNAMICS, GROTON, CONNECTICUT
4 PAGES, LETTER - GENERAL DYNAMICS TO AEC - JULY 10, 1969

ON JUNE 11, 1969 AT 1920 HOURS, TWO RADIOGRAPHERS ASSISTANTS WERE EXPOSED TO AN 80 CURIE IRIIDIUM-192 SOURCE. RADIOGRAPHER C RETRACTED SOURCE AFTER OPERATION, RADIOGRAPHER A SURVEYED THE DEVICE BUT FAILED TO SURVEY AREA WHERE SOURCE ENTERS SHIELD. WHILE DISCONNECTING SOURCE TUBE ASSEMBLY A NOTICED SURVEY METER GIVING AUDIBLE INDICATION. WHEN THE SHIPPING PLUG COULD NOT BE PLACED

41534 *CONTINUED*

INTO POSITION BOTH DISCOVERED SOURCE WAS EXPOSED. A RECEIVED 3 REM WHOLE BODY, 600 REM RIGHT HAND AND FOREARM, AND 45 REM TO LEFT HAND AND FOREARM. OPERATOR A AND THE RADIOGRAPHER IN CHARGE WERE SUSPENDED FOR 4 DAYS WITHOUT PAY.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D. C. 20545 (25 CENTS/PAGE)

*INCIDENT, EXPOSURE + FAILURE, OPERATOR ERROR + SURVEY, RADIATION + PERSONNEL EXPOSURE, RADIATION + *INCIDENT, HUMAN ERROR + *OPERATING EXPERIENCE

37498

ELECTRIC BOAT DIVISION CITED BY AEC FOR OVEREXPOSURE OF RADIOGRAPHY PERSONNEL
GENERAL DYNAMICS CORP., ELECTRIC BOAT DIVISION, GROTON, CONN.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE, 15(37), PAGE 17 (SEPTEMBER 15, 1969)

BECAUSE OF A MISUNDERSTOOD ORAL REPLY A RADIOGRAPHER AND HELPER WERE OVEREXPOSED TO AN IRIIDIUM-192 SOURCE. THE SOURCE WAS CONSIDERED TO BE IN ITS SHIELDED CONTAINER, AND THE SOURCE TUBE ASSEMBLY WAS DISCONNECTED WHEN IT WAS DISCOVERED THAT THE SOURCE WAS NOT SEATED IN ITS SHIELD. IF THE FOLLOWUP SURVEY HAD TAKEN PLACE, THE EXPOSURE COULD HAVE BEEN PREVENTED.

*FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION + *SHIELDING + IRIIDIUM

61907

OVEREXPOSURE OF EMPLOYEE AT GENERAL DYNAMICS
GENERAL DYNAMICS, ELECTRIC BOAT DIVISION, GROTON, CONNECTICUT
4 PAGES, LETTER - GENERAL DYNAMICS TO DIVISION OF COMPLIANCE (AEC) - DECEMBER 22, 1970

CONSTRUCTION WAS PROCEEDING NORMALLY. THE SOURCE WAS CRANKED IN, AND THE STORED LIGHT WAS OBSERVED BY 2 WORKERS. ONE OF THEM THEN PROCEEDED INTO THE REACTOR COMPARTMENT TO CHECK THE CAMERA. HIS SURVEY METER WAS SET ON THE X-1 SCALE INSTEAD OF THE X-10. WHEN PLACED AT THE SIDE OF THE CAMERA, IT PEGGED, BUT THE MAN FAILED TO RECOGNIZE THIS AS ABNORMAL. HIS EXPOSURE WAS 4455 MR. CHECKS OF EQUIPMENT INDICATED IT WORKED PROPERLY. WORKERS INSTRUCTED IN PROPER USE OF SURVEY EQUIPMENT.

RADIOGRAPHIC OPERATIONS IN THE REACTOR COMPARTMENT OF A SUBMARINE UNDER CONSTRUCTION WAS PROCEEDING NORMALLY.
AVAILABILITY DATA

INCIDENT, EXPOSURE + FAILURE, EQUIPMENT + *FAILURE, OPERATOR ERROR + SOURCE, RADIATION + *PERSONNEL EXPOSURE, RADIATION

60008

GENERAL STEEL INDUSTRIES CITED FOR NONCOMPLIANCE
U.S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE
2 PAGES, LETTER - DIVISION OF COMPLIANCE (AEC) TO GENERAL STEEL INDUSTRIES - DECEMBER 18, 1970

GENERAL STEEL INDUSTRIES WAS CITED FOR 7 ITEMS OF NONCOMPLIANCE. SOURCE STORAGE ROOMS WERE NOT PROPERLY POSTED. COPY OF LICENSE WAS NOT POSTED. A SOURCE WAS STORED IN AN UNRESTRICTED AREA. UTILIZATION LOGS WERE INCOMPLETE. RADIOGRAPHIC OPERATIONS WERE CONDUCTED WITHOUT A CALIBRATED SURVEY INSTRUMENT. SURVEY RECORDS WERE NOT ALWAYS MAINTAINED. RESULTS OF ANNUAL TESTS OF RADIOGRAPHERS WERE NOT AVAILABLE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*FAILURE, ADMINISTRATIVE CONTROL + SOURCE, RADIATION + FAILURE, OPERATOR ERROR + INFORMATION RETRIEVAL + INSTRUMENT CALIBRATION + *RECORDS + RADIATION EXPOSURE, RECORD KEEPING + SURVEY, RADIATION

61438

CORRECTIVE STEPS TAKEN BY GENERAL STEEL INDUSTRY
GENERAL STEEL INDUSTRIES, INC., ILLINOIS
2 PAGES, LETTER - GENERAL STEEL INDUSTRIES TO DIVISION OF COMPLIANCE (AEC) - JANUARY 7, 1971

THE FOLLOWING STEPS WERE TAKEN TO CORRECT NON-COMPLIANCES. NEW RADIATION SIGNS WERE OBTAINED. COPY OF LICENSE WAS POSTED. SOURCES ARE STORED IN A RESTRICTED ROOM. NEW UTILIZATION LOGS WERE PREPARED. NEW SURVEY METERS WERE PURCHASED AND CALIBRATED. RECORDS ARE KEPT TO ASSURE THAT THE SOURCES ARE SHIELDED BEFORE BEING STORED. RADIOGRAPHERS WILL BE TESTED ANNUALLY AND TESTS FILED.

*ADMINISTRATIVE CONTROL + *SOURCE, RADIATION + TESTING + INSTRUMENT CALIBRATION + *RADIATION SAFETY AND CONTROL

10196

OVEREXPOSURE UNREPORTED BECAUSE OF UNRELIABLE READINGS
GENERAL TESTING COMPANY, LISBON, OHIO
1 PAGE, ATOMIC ENERGY CLEARING HOUSE, 12(20), PAGE 35, (MAY 16, 1966)

GARDRAY FILM BADGE SERVICE SHOWED A 3.5-REM EXPOSURE FOR ONE INDIVIDUAL, WHILE THE CONTROL BADGES FOR FOUR INDIVIDUALS SHOWED NO EXPOSURE. THIS WAS NOT REPORTED BECAUSE IT WAS THOUGHT IN ERROR.

10196 *CONTINUED*

PREVIOUSLY READINGS WERE SHOWN FOR UNUSED BADGES, AND USED-BADGE READINGS WERE IN EXCESS OF DAILY DOSIMETER RECORDS. WE RELOCATED THE BADGE-STORAGE RACK AWAY FROM A GAS HEATER. AFTER THE FEBRUARY INSPECTION, TWO FILM BADGES WERE WORN, BUT THE READINGS ARE NOT IN AGREEMENT.

*PERSONNEL PROTECTIVE DEVICE + *OPERATING EXPERIENCE SUMMARY + FAILURE, INSTRUMENT + PERSONNEL EXPOSURE, RADIATION

26321

AEC CITATION FOR NONCOMPLIANCE WITH RADIOGRAPHY PROCEDURES
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D. C.

2 PAGES, LETTER TO GLOBAL X-RAY AND TESTING CORP. FROM E.R. PRICE, DECEMBER 1, 1965

AN AEC INSPECTION IN OCTOBER 1965 RESULTED IN CITATION FOR (1) POSSESSING A SOURCE NOT AUTHORIZED BY LICENSE AND (2) USING A SOURCE IN ANCHORAGE, ALASKA, CONTRARY TO LICENSE.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

SOURCE, RADIATION + *FAILURE, ADMINISTRATIVE CONTROL

26306

COBALT 60 RADIOGRAPHY SOURCE DROPPED INTO GULF OF MEXICO
GLOBAL X-RAY AND TESTING CORPORATION

1 PAGE, TWX TO AEC DIVISION OF COMPLIANCE FROM I. ST ROMAIN, JUNE, 1966

GLOBAL X-RAY AND TESTING CO. REPORTS THAT A 7.8-CURIE CO-60 SOURCE WAS DROPPED INTO THE GULF OF MEXICO 50 MILES SOUTH OF LEESVILLE, LA. DEPTH OF WATER WAS 150 FT. AN UNSUCCESSFUL ATTEMPT WAS MADE TO RETRIEVE THE SOURCE WITH A LARGE MAGNET. THE CRANK AND SOURCE TUBE HAD BEEN REMOVED FOR TRANSFER TO A NEW LOCATION. WHEN RADIOGRAPHER WAS READY FOR NEXT EXPOSURE, HE NOTICED PIGTAIL WAS GONE. DOSE WAS 10 MR FOR 3 DAYS WORK.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

OCEAN AND SEA + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR + *SOURCE, RADIATION, LOST

40442

RADIOGRAPHER WALKS INTO EXPOSURE AREA
GREDE FOUNDRIES, INC., WISCONSIN

2 PAGES, LETTER - GREDE FOUNDRIES TO AEC DIVISION OF COMPLIANCE - MAY 27, 1969

ON MAY 7, 1969, RADIOGRAPHER WALKED INTO EXPOSURE AREA AND RECEIVED AN ESTIMATED DOSE OF 1.9 REMS - FILM BADGE READ 1.75 REMS FOR QUARTER. CAUSE WAS HUMAN ERROR (GAMMA ALARM WITH RED LIGHT WAS FUNCTIONING PROPERLY). THIS IS FIRST TIME HE HAS RECEIVED AN OVEREXPOSURE IN 10 YEARS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

INCIDENT, EXPOSURE + COBALT + FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION + *INCIDENT, HUMAN ERROR

26305

RADIOGRAPHY EXPOSURE AT GREEN BAY X-RAY SERVICE INC.
GREEN BAY X-RAY SERVICE INC., HARBOR BEACH, MICHIGAN

3 PAGES, TWX TO AEC DIVISION OF COMPLIANCE FROM R.G. GALLAGHER, OCTOBER 9, 1967

REPORTS THAT A RADIOGRAPHER AND HIS ASSISTANT MAY HAVE RECEIVED A WHOLE-BODY DOSE OF 5 TO 20 R AND POSSIBLY UP TO 10,000 R TO THE HAND OF ONE MAN FROM AN UNRETRACTED 64-CURIE IRIIDIUM-192 SOURCE. DOSIMETERS OF BOTH INDIVIDUALS WERE OFF SCALE, INDICATING GREATER THAN 1-R EXPOSURES.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

SOURCE, RADIATION + *PERSONNEL EXPOSURE, RADIATION + INCIDENT, NONREACTOR

41147

RADIOGRAPHERS FILM BADGE EXPOSURE EXCESSIVE
GREEN BAY X-RAY SERVICE, INC.

3 PAGES, LETTER - GREEN BAY X-RAY SERVICE, INC. TO AEC DIVISION OF COMPLIANCE - DECEMBER 1 1969

REPORTS A FILM-BADGE EXPOSURE OF 5000 MILLIROENTGENS FOR INDIVIDUAL FOR MONTH OF OCTOBER, BUT DOSIMETER READINGS TOTAL ONLY 704 MR. THE ACCEPTED EXPLANATION IS THAT THE FILM BADGE WAS PLACED NEAR A CAMERA DURING AN EXPOSURE AND THAT NO OVERDOSE OCCURRED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION

57462

57462 *CONTINUED*
TWO WORKERS EXPOSED WHILE REPAIRING AN X-RAY CAMERA
GREEN BAY X-RAY SERVICE
1 PAGES, TWX - GREEN BAY X-RAY SERVICE TO DIVISION OF COMPLIANCE (AEC) - OCTOBER 19, 1970

A 47-CURIES IR-192 SOURCE FAILED TO RETRACT INTO THE CAMERA. WHILE WORKING TO SECURE THE SOURCE IN THE CAMERA, TWO WORKERS WERE EXPOSED TO ABOUT 200 MR EACH. X-RAY WORK WAS BEING DONE FOR PANHANDLE EASTERN'S PIPELINE CO., TUSCOLA, ILL.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + *FAILURE, EQUIPMENT + SOURCE, RADIATION + MAINTENANCE AND REPAIR

61908
GREEN BAY X-RAY SERVICE CITED FOR NON-COMPLIANCE
U.S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE
3 PAGES, LETTER - DIVISION OF COMPLIANCE (AEC) TO GREEN BAY X-RAY SERVICE - NOVEMBER 10, 1970

GREEN BAY X-RAY SERVICE CITED FOR 7 ITEMS OF NONCOMPLIANCE. RADIOGRAPHER WAS NOT TRAINED IN SAFETY REGULATIONS PROPERLY. SOURCES NOT INSPECTED ON SCHEDULE. SURVEY AND PERSONNEL MONITOR RECORDS WERE NOT MAINTAINED PROPERLY. SOURCES WERE NOT PROPERLY IDENTIFIED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*REGULATION, AEC + *RADIATION SAFETY AND CONTROL + *RECORDS + SOURCE, RADIATION + MONITOR, PERSONNEL + LEAK

59949
GREEN BAY X-RAY SERVICES REPLIES TO NONCOMPLIANCE LETTER
GREEN BAY X-RAY SERVICE, INC., WISCONSIN
10 PAGES, LETTER - GREEN BAY X-RAY SERVICE, INC. TO DIVISION OF COMPLIANCE - NOVEMBER 30, 1970

REPLIES TO 7 ITEMS OF NONCOMPLIANCE INVOLVING RECORD KEEPING, TRAINING OF TECHNICIANS, AND INSPECTION SOURCES.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*TRAINING + *TESTING + RADIATION EXPOSURE, RECORD KEEPING + *SOURCE, RADIATION

47187
34 ITEMS OF NONCOMPLIANCE CITED - RADIOGRAPHIC WORK
U.S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE
9 PAGES, LETTER - DIVISION OF COMPLIANCE (AEC) TO GRINNELL COMPANY - DECEMBER 24, 1969

BASED ON THE RESULTS OF THE THREE INSPECTIONS (ONE AT EACH OF THREE LOCATIONS), IT APPEARS THAT CERTAIN ACTIVITIES WERE NOT CONDUCTED IN FULL COMPLIANCE WITH CONDITIONS OF YOUR LICENSE AND THE REQUIREMENTS OF AEC STANDARDS FOR PROTECTION AGAINST RADIATION. IN ORDER TO ASCERTAIN THE RESULTS OF THE CORRECTIVE ACTIONS TAKEN BY THE COMPANY, WE PLAN TO CONDUCT ADDITIONAL INSPECTIONS OF YOUR OPERATIONS. THE RESULTS OF THESE INSPECTIONS, AS WELL AS YOUR REPLY TO THIS NOTICE, WILL FORM THE BASIS FOR ANY FURTHER ENFORCEMENT ACTION WE MAY TAKE IN THIS MATTER, IF ANY, SUCH AS MODIFICATION, SUSPENSION, OR REVOCATION OF YOUR LICENSE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + *FAILURE, ADMINISTRATIVE CONTROL

00508
NON COMPLIANCE WITH STANDARDS FOR RADIATION PROTECTION
U.S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE
2 PAGES, LETTER - DIVISION OF COMPLIANCE (AEC) TO GRINNELL COMPANY, INC. - JULY 22, 1970

AN INSPECTION REVEALED THE FOLLOWING DEFICIENCIES - (1) NO PROTECTION AGAINST UNAUTHORIZED ENTRY TO HIGH-RADIATION AREA DURING RADIOGRAPHY. (2) UTILIZATION LOGS DID NOT INDICATE ASSIGNEE OF SOURCE. (3) PERSONNEL MONITORING RECORDS NOT PROPERLY MAINTAINED. (4) VEHICLES FOR SOURCE TRANSPORTATION NOT PROPERLY LABELED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*SOURCE, RADIATION + PERSONNEL EXPOSURE, RADIATION + FAILURE, ADMINISTRATIVE CONTROL + RADIATION EXPOSURE, RECORD KEEPING + RADIATION SAFETY AND CONTROL

60000
TWO MEN RECEIVE OVER-EXPOSURE AT GRINNELL CORP.

60000 *CONTINUED*
GRINNELL CORPORATION, INC., RHODE ISLAND
7 PAGES, LETTER - GRINNELL CORPORATION, INC. TO DIVISION OF COMPLIANCE (AEC) - OCTOBER 20, 1970

A RADIOGRAPHER AND HIS ASSISTANT RECEIVED OVEREXPOSURES WHEN A SOURCE WAS NOT FULLY WITHDRAWN INTO THE PROJECTOR AND THE PROJECTOR WAS THEN MOVED TO ANOTHER LOCATION. A SURVEY WHICH INDICATED THE SOURCE WAS WITHDRAWN WAS NOT MADE PROPERLY. THE ERROR WAS NOT DISCOVERED UNTIL THE PROJECTOR HAD BEEN MOVED. FILM BADGE READINGS INDICATED EXPOSURES OF 2.45 AND 1.45 REM. TESTS SHOWED THE EQUIPMENT WAS IN GOOD CONDITION. RESULTS OF BLOOD STUDIES SHOW NO EVIDENCE OF RADIATION DAMAGE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + *FAILURE, OPERATOR ERROR + SOURCE, RADIATION + SURVEY, RADIATION

65440
POSSIBLE EXPOSURE OF 2 RADIOGRAPHERS DURING CONSTRUCTION OF QUAD CITES REACTOR
GRINNELL COMPANY, PROVIDENCE, RHODE ISLAND
10 PAGES, LETTER FROM GRINNELL COMPANY TO DIVISION OF COMPLIANCE, MAY 7, 1971

A RADIOGRAPHER AND HIS ASSISTANT MAY HAVE RECEIVED EXPOSURES OF ABOUT 3 REMS EACH AT THE QUAD CITIES REACTOR SITE. THEIR DOSIMETERS WERE OFF SCALE. READINGS WERE FROM FILM BADGES. NO UNUSUAL OCCURRENCES WERE NOTED SO THAT EXACT CAUSE OR LOCATION OF EXPOSURE COULD BE DETERMINED. THE COMPANY (GRINNELL) WAS CITED FOR NONCOMPLIANCE IN FAILURE TO DISCONNECT THE SOURCE TUBE AND INSERT PLUG INTO RADIOGRAPHIC DEVICE BEFORE MOVING IT.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + *FAILURE, OPERATOR ERROR + SOURCE, RADIATION

2637C
RADIOGRAPHY SOURCE DROPPED INTO KAW RIVER
H.R. INSPECTION SERVICE, SHAWNEE, KANSAS
1 PAGE, LETTER TO AEC DIVISION OF LICENSING AND REGULATIONS FROM H.W. ROGERS, APRIL 12, 1964

WHILE MAKING EXPOSURES ON A BRIDGE BEING BUILT OVER THE KAW RIVER, A GUST OF WIND BLEW A WELDER'S SCAFFOLD OVER, KNOCKING A CAMERA AND SOURCE INTO 5 FT OF WATER. THE SOURCE GUIDE-TUBE BROKE, AND THE SOURCE DISCONNECTED FROM THE CONTROL CABLE. THE SOURCE WAS RETRIEVED WITH A ROPE AND MAGNET. MAXIMUM PERSONNEL EXPOSURE WAS 125 MILLIREMS. A SAFETY CHAIN ON THE CAMERA WILL BE USED FOR FUTURE EXPOSURES.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

RIVER + INCIDENT, NONREACTOR + INCIDENT, RECOVERY FROM + *SOURCE, RADIATION, LOST

32280
NONCOMPLIANCE CITATION FOLLOWING RADIOGRAPHER OVEREXPOSURE
U.S. AEC
2 PAGES, LETTER TO R.B. HEYWARD, DURALCY CO., DECEMBER 12, 1968

AN INSPECTION OCT. 31, AFTER AN OCT. 23 OVEREXPOSURE, RESULTED IN A CITATION FOR THE FOLLOWING - (1) ON OCT. 23, INADEQUATE SURVEYS AFTER EACH EXPOSURE DID NOT DETERMINE SOURCE RETURNED TO SHIELD. (2) MAY 10 SURVEYS WERE NOT MAINTAINED. INDIVIDUAL WAS EXPOSED TO ADDITIONAL RADIATION AFTER RADIATION SAFETY OFFICER CALCULATED THAT HIS EXPOSURE WAS ABOVE LIMITS. (REPLY DEC. 26) - (1) SURVEY TECHNIQUES WERE REVIEWED, AND A PERSONNEL MONITOR PURCHASED. (2) RECORDS REQUIRED BY 10 CFR 20.401(b) ARE NOW PART OF DAILY LOG. (3) CONTINUED OPERATION BY RADIOGRAPHER WAS DUE TO RSC MISUNDERSTANDING CODE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545, (\$0.25 CENTS/PAGE)

INCIDENT, EXPOSURE + PERSONNEL PROTECTIVE DEVICE + SURVEY, RADIATION + FAILURE, ADMINISTRATIVE CONTROL

60004
RADIATION SOURCE LOST BY HEWLETT-PACKARD
HEWLETT-PACKARD, PENNSYLVANIA
2 PAGES, LETTER - HEWLETT-PACKARD TO DIVISION OF COMPLIANCE (AEC) - NOVEMBER 19, 1970

A 2 MILLICURIE SOURCE WAS RECEIVED AS PART OF A SHIPMENT OF DEFECTIVE PARTS. SEVERAL DAYS LATER THE ENTIRE SHIPMENT WAS MISSING AND COULD NOT BE LOCATED. BELIEVED TO HAVE BEEN PLACED IN TRASH PICK-UP AREA AND BURIED WITH OTHER TRASH. IN THE FUTURE RADIOACTIVE MATERIAL WILL BE PROCESSED QUICKLY AND WILL BE STORED IN LOCKED AREA UNTIL IT IS PROCESSED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

NICKEL + *SOURCE, RADIATION + FAILURE, OPERATOR ERROR

26313
AEC CITATION FOR DEFICIENCIES IN RADIOGRAPHY OPERATIONS
UNITED STATES ATOMIC ENERGY COMMISSION
2 PAGES, LETTER TO INDUSTRIAL LABS FROM E.R. PRICE, SEPTEMBER 30, 1963

AN INSPECTION JUNE 13 AND 14, 1963, RESULTED IN CITATION FOR (1) ALLOWING RADIATION LEVELS TO EXCEED LIMITS ON STORAGE CONTAINER AND (2) USING 5.5-CURIE CO-60 SOURCE TO CALIBRATE A SURVEY METER, CONTRARY TO LICENSE LIMITATION ON USE.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

SOURCE, RADIATION + *INSTRUMENT CALIBRATION + RADIATION SAFETY AND CONTROL + STORAGE CONTAINER + *FAILURE, ADMINISTRATIVE CONTROL

26369
MINOR RADIOGRAPHY INCIDENT CREATES FEAR
INDUSTRIAL LABORATORIES, INC., CHATTANOOGA, TENNESSEE
2 PAGES, LETTER TO AEC REGION II DIVISION OF COMPLIANCE FROM L. COOK, OCTOBER 23, 1963

A NEWLY QUALIFIED RADIOGRAPHER, AFTER PERFORMING AN EXPOSURE, RETRACTED THE SOURCE. BINDING OCCURRED DUE TO GRIT IN THE CABLE, WHEN THE SOURCE WAS A FEW INCHES OUTSIDE THE CONTAINER. SUPERVISION WAS NOTIFIED AND WAS ABLE TO RETRIEVE THE SOURCE VERY SHORTLY AFTER THEIR ARRIVAL. NO EXCESSIVE EXPOSURES OCCURRED. CONSTRUCTION WORKERS WHO WERE SATISFIED TO WORK THERE DURING REGULAR EXPOSURES WERE VERY DISTURBED WHEN THEY HEARD OF THE DIFFICULTY. THEY WERE TRANSFERRED TO A DIFFERENT AREA TO LESSEN THEIR FEELING OF DANGER.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

SOURCE, RADIATION + *INCIDENT, EQUIPMENT + *RADIATION, PUBLIC EDUCATION

59284
INSPECTION SIGNAL SERVICES CITED FOR NONCOMPLIANCE
U. S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE
2 PAGES, LETTER - DIVISION OF COMPLIANCE (AEC) TO INSPECTION SIGNAL SERVICE, INC. - SEPTEMBER 22, 1970

CERTAIN ACTIVITIES FAILED TO MEET REGULATIONS. RADIATION LEVEL OUTSIDE TRUCK CONTAINING IR-192 SOURCE WAS EXCESSIVE. INADEQUATE EVALUATION OF DOSE TO WORKER WAS MADE DURING RECOVERY OF A SOURCE. RADIATION AREAS WERE NOT POSTED PROPERLY. RADIOGRAPHERS WERE NOT PROPERLY INSTRUCTED. A FILM BADGE WAS NOT PROCESSED IMMEDIATELY WHEN A POCKET DOSIMETER WAS DISCHARGED BEYOND ITS RANGE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*FAILURE, ADMINISTRATIVE CONTROL + SOURCE, RADIATION + SURVEY, RADIATION + PERSONNEL EXPOSURE, RADIATION + TRAINING + *RADIATION SAFETY AND CONTROL + MONITORING SYSTEM, RADIATION

57399
FAILURE OF INSPECTION SIGNAL SERVICES TO RESPOND COMPLETELY TO NONCOMPLIANCE LETTER
INSPECTION SIGNAL SERVICES
2 PAGES, LETTER - DIVISION OF COMPLIANCE (AEC) TO INSPECTION SIGNAL SERVICES - OCTOBER 30, 1970

INSPECTION SIGNAL SERVICES FAILED TO REPLY COMPLETELY TO A NONCOMPLIANCE LETTER. ADDITIONAL INFORMATION IS REQUESTED. CORRECTIVE ACTION TAKEN TO PREVENT INADEQUATE RADIATION SURVEYS WAS NOT SPECIFIED. LETTER DOES NOT STATE THAT COMPANY WILL COMPLY WITH REGULATIONS REGARDING POSITIONS OF STORAGE AREAS. NO INDICATION GIVEN WHETHER DEFICIENCY HAD BEEN CORRECTED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*FAILURE, ADMINISTRATIVE CONTROL

59280
INSPECTION SIGNAL SERVICES CORRECTS ITEM OF NONCOMPLIANCE
INSPECTION SIGNAL SERVICE, INC., LOUISIANA
2 PAGES, LETTER - INSPECTION SIGNAL SERVICE, INC., TO DIVISION OF COMPLIANCE (AEC) - NOVEMBER 4, 1970

RADIATION SAFETY OFFICER WILL CONDUCT INVESTIGATION OF ALL RADIATION INCIDENTS. ALL VEHICLES AND STORAGE AREAS CONTAINING RADIATION SOURCE WILL BE POSTED. RADIATION SAFETY TRAINING WILL BE REQUIRED FOR ALL RADIOGRAPHERS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*RADIATION SAFETY AND CONTROL + SOURCE, RADIATION + TRAINING + INFORMATION RETRIEVAL

06920
SYLVESTER JG
RADIATION EXPOSURE AT J. G. SYLVESTER ASSOCIATES, INC. JULY 14, 1965
J. G. SYLVESTER ASSOCIATES, INC., ROCKLAND, MASS.
1 PAGE- JULY 16, 1965, ATOMIC ENERGY CLEARING HOUSE 11(32)- 28 (AUGUST 9, 1965)- PDR

A RADIOGRAPHER INADVERTENTLY CHANGED FILM AND RESET A CASTING WITH SOURCE COBALT 60, STRENGTH 32 CURIES IN COLLIMATOR 36 INCHES FROM FILM. IN HIS WORKING POSITION HIS FOREHEAD WAS IN THE BEAM AT APPROXIMATELY 12 INCHES FOR 23 SECONDS AND HIS HANDS AT 32 INCHES FOR 50 SECONDS. HIS EXPOSURE FROM CALCULATIONS AND FILM BADGE WAS (1) HEAD - 2.9 REMS, (2) HANDS 890 MREM. THE FILM BADGE WAS IMMEDIATELY PROCESSED AND WAS ASSESSED AT 776 MP. IT WAS ESTIMATED THE FILM BADGE ON BREAST POCKET WAS 23 INCHES TO 24 INCHES FROM SOURCE DURING THIS EXPOSURE. THIS WAS CAUSED BY THE ANXIETY OF THE RADIOGRAPHER TO MAKE PRODUCTION AS HIGH AS POSSIBLE. HE SAID HE WAS THINKING ABOUT WHAT HE WAS GOING TO DO RATHER THAN WHAT HE WAS DOING. HE DID VIOLATE THE STANDARD OPERATING PROCEDURE OF CARRYING THE SURVEY METER (WHICH WAS AT HIS LEFT HAND WHEN CRANKING) IN TO CHECK RETRACTION AND PLACING METER BY THE SETUP UNTIL HE RETURNED. IN ORDER TO AVOID SUCH AN INCIDENT AGAIN, THE THREE OPERATING RADIOGRAPHERS WERE RE-BRIEFED ON THE OPERATING PROCEDURE AND OF COURSE THE INCIDENT ITSELF SERVED VERY WELL IN ALERTING ALL HANDS TO THE DANGERS INVOLVED.

HEALTH PHYSICS TRAINING + SOURCE, RADIATION + TRAINING + PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + *INCIDENT, HUMAN ERROR + *INCIDENT, NONREACTOR

57042
OVEREXPOSURE OF TWO WORKERS AT JOHNSON GRINNELL CORP.
JOHNSON GRINNELL CORPORATION
1 PAGE, TWX - JOHNSON GRINNELL CORPORATION TO DIVISION OF COMPLIANCE (AEC) - SEPTEMBER 22, 1970

POSSIBLE RADIATION EXPOSURE OF 10 TO 16 REMS TO ONE WORKER AND 1 REM TO ANOTHER AT JOHNSON GRINNELL CORP.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION

65446
JONES TESTING LAB REPORT ON OVEREXPOSURE AND ANSWERS LETTER OF NON-COMPLIANCE
JONES TESTING LABORATORY, INCORPORATED, WASHINGTON, PENNSYLVANIA
10 PAGES, LETTER FROM JONES LABORATORY TO DIVISION OF COMPLIANCE, JUNE 3, 1971

AN EMPLOYEE OPERATING 2 SOURCES IN SEPARATE ROOMS RAISED THE WRONG SOURCE AND THEN ENTERED THAT ROOM. REMAINED THERE ABOUT 7 MIN. ESTIMATED EXPOSURE TO LEFT HAND WAS 72 REMS. SINCE THE INCIDENT, POSITIVE WARNING DEVICES HAVE BEEN INSTALLED TO INDICATE AN EXPOSED SOURCE. FORMAL TRAINING IS PROVIDED BY COMPANY FOR ALL RADIOGRAPHERS. POSTING OF SIGNS WAS REVIEWED. THE INDIVIDUAL WAS NOTIFIED OF HIS ESTIMATED EXPOSURE DOSE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + COBALT + *FAILURE, OPERATOR ERROR + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR + INCIDENT, EXPOSURE

26360
FIRE CONSUMES TRUCK TRANSPORTING RADIOGRAPHY SOURCE
LANE-WELLS, HOUSTON, TEXAS
3 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSE RELATIONS FROM J.C. WILSON, AUGUST 29, 1966

A FIRE CONSUMED A TRUCK TRANSPORTING A 1-CURIE CESIUM SOURCE. WHEN THE FIRE WAS EXTINGUISHED, THE SOURCE WAS FOUND FLOATING ON THE MOLTEN LEAD FROM THE SHIELD. THE SOURCE WAS RETRIEVED, UNDAMAGED, AND PLACED ON A LID OF A TOOL BOX. WHILE WAITING FOR A RADIOLOGICAL ASSISTANCE TEAM CALLED BY A HIGHWAY PATROLMAN ON THE SCENE, THE PATROLMAN PICKED UP THE SOURCE AND HELD IT FOR 1 MIN. HE RECEIVED A DOSE OF 100 MILLIREMS WHOLE BODY AND 10 REMS TO HANDS. OTHER EXPOSURES WERE MINIMAL.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FIRE + SOURCE, RADIATION + *TRANSPORTATION AND HANDLING + PERSONNEL EXPOSURE, RADIATION + INCIDENT, NONREACTOR

26367
RADIOGRAPHY EXPOSURE RESULTING FROM FAILURE TO SURVEY
LAW ENGINEERING TESTING CO., BIRMINGHAM, ALABAMA
3 PAGES, LETTER TO DIVISION OF STATE AND LICENSE RELATIONS (E.R. PRICE) FROM G.H. NELSON, NOVEMBER 20, 1964

A RADIOGRAPHER CONDUCTING EXPOSURES WITHOUT A SURVEY INSTRUMENT DISCOVERED THAT HIS DOSIMETER WAS OFF SCALE. SUPERVISOR INCORRECTLY ADVISED HIM TO SECURE THE SOURCE, WHICH HE ATTEMPTED BUT IN FACT DID NOT. UNSHIELDED SOURCE DISCOVERED 19 HR LATER. REPLY TO CITATION INDICATED THAT A DIRECTIVE HAD BEEN SENT TO ALL EMPLOYEES, WHICH INDICATED IMMEDIATE DISMISSAL IF PROPER RADIATION MONITORS WERE NOT USED DURING OPERATIONS. RADIOGRAPHER RESTRICTED UNTIL COMPLETION OF RETRAINING

26367 *CONTINUED*
PROGRAM.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*MONITOR, PERSONNEL + SOURCE, RADIATION + PERSONNEL EXPOSURE, RADIATION + *INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR

56076
POSSIBLE OVEREXPOSURE OF EMPLOYEE AT THE LONG BEACH NAVAL SHIPYARD
LONG BEACH NAVAL SHIPYARD, CALIFORNIA
3 PAGES, LETTER - LONG BEACH NAVAL SHIPYARD TO U.S. ATOMIC ENERGY COMMISSION - AUGUST 20, 1970

THE PHOTODOSIMETRIC FILM OF AN EMPLOYEE SHOWED A DENSITY EQUIVALENT TO 10 REMS EXPOSURE FOR THE PERIOD JUNE 15 TO JULY 14, 1970. DURING THIS PERIOD HIS DOSIMETER INDICATED A TOTAL EXPOSURE OF ONLY 0.011 REM. FILM OF OTHER WORKERS IN THIS AREA SHOWED EXPOSURES LESS THAN 0.031 REM FOR THE SAME PERIOD. A BLOOD SAMPLE TAKEN ON JULY 30 WAS IN THE NORMAL RANGE. NO EVIDENCE OF OVEREXPOSURE WAS FOUND. THE FILM MAY HAVE BEEN EXPOSED TO VISIBLE LIGHT. CONCLUDED THAT NO OVEREXPOSURE OCCURRED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + FAILURE, INSTRUMENT + *INSTRUMENT, ABNORMAL INDICATION + MONITOR, PERSONNEL + FILM

07995
LENT F
RADIATION EXPOSURE AT MAGNAFLUX CORP., EAST HARTFORD, CONN.
MAGNAFLUX CORP.
2 PAGES- JULY 26, 1965, ATOMIC ENERGY CLEARING HOUSE 11(36)- 26-27 (SEPTEMBER 6, 1965)- PDR

THROUGH THE IMMEDIATE PROCESSING OF THE RADIOGRAPHERS FILM BADGE, IT WAS FOUND THAT THE AMOUNT OF RADIATION ABSORBED ON JUNE 25 WAS 1740 MILLIROENTGENS. THE ISOTOPE BEING USED AT THE TIME WAS 4.2 CURIES, OF COBALT 60. THE TOTAL EMISSION OF THE SOURCE WOULD THEREFORE BE 58.7 R/HR AT 12 INCHES. THIS INCIDENT OCCURRED DUE TO FAILURE TO CHECK THE LOCATION OF THE SOURCE WITH THE RADIATION SURVEY METER AT THE COMPLETION OF AN EXPOSURE. THE RADIOGRAPHER HAD NOT RETRACTED THE SOURCE TO THE STORED POSITION IN THE CONTAINER. A CORRECTIVE MEASURE WAS TAKEN IMMEDIATELY. THE RADIOGRAPHER HAS LECTURED ON THE SERIOUSNESS OF THIS ERROR AND OF THE PHYSICAL DANGERS WHICH ACCOMPANY IT. THE LABORATORY MANAGER AND COMPANY DIRECTOR OF RADIATION SAFETY AND CONTROL WERE, OF COURSE, NOTIFIED SHORTLY THEREAFTER. AT THAT TIME AN AUDIBLE RADIATION ALARM WAS REQUISITIONED AND IS, AT THIS TIME, A PART OF THE EXPOSURE ROOM. IN ADDITION, THIS ACCIDENT WAS DISCUSSED THOROUGHLY WITH ALL RADIOGRAPHERS TO PREVENT ANY REOCCURRENCE OF THIS KIND IN THE FUTURE.

*ADMINISTRATIVE CONTROL + FAILURE, OPERATOR ERROR + SAFETY REVIEW + *TRAINING + OPERATING EXPERIENCE SUMMARY + *PERSONNEL EXPOSURE, RADIATION + *RADIATION SAFETY AND CONTROL + INCIDENT, HUMAN ERROR + *INCIDENT, NONREACTOR

07994
WINTERS WR
RADIATION INCIDENT AT MAGNAFLUX CORP., CHICAGO, ILLINOIS
MAGNAFLUX CORP.
1 PAGE- AUGUST 9, 1965, ATOMIC ENERGY CLEARING HOUSE 11(36)- 26 SEPTEMBER 6, 1965)- PDR

THIS INCIDENT CONSISTED OF AN EXCESSIVE EXPOSURE TO A RADIOGRAPHER, EMPLOYED BY THE CLEVELAND MATERIALS TESTING LABORATORY, ON JULY 13, 1965, AT YOUNGSTOWN, OHIO. THE RADIOGRAPHERS FILM BADGE WAS PROCESSED AND AN EXPOSURE OF 8200 MR WAS SHOWN. THE RADIOGRAPHER WAS USING A 38 CURIE SOURCE OF IRIIDIUM 192 IN A T. O. 533 RADIOGRAPHIC EXPOSURE DEVICE. THE CAUSE OF THIS EXPOSURE WAS THE DISREGARD OF THE RADIATION SAFETY REGULATIONS BY THE RADIOGRAPHER AND THE LABORATORY MANAGER. THE CORRECTIVE STEPS TO ASSURE THERE WILL BE NO REOCCURRENCE OF A SIMILAR SITUATION WILL BE TO REQUIRE ALL RADIOGRAPHERS TO REVIEW THE RADIATION SAFETY PROCEDURES- TO PLACE INCREASED EMPHASIS ON THE PROPER USE OF SURVEY METERS AND DOSIMETERS- AND TO MAKE SURE ALL RADIOGRAPHERS ARE FAMILIAR WITH THE OPERATING PROCEDURES OF THE GAMMA EXPOSURE DEVICES.

*ADMINISTRATIVE CONTROL + FAILURE, OPERATOR ERROR + SAFETY REVIEW + *TRAINING + *PERSONNEL EXPOSURE, RADIATION + *RADIATION SAFETY AND CONTROL + INCIDENT, HUMAN ERROR + *INCIDENT, NONREACTOR + *OPERATING EXPERIENCE

08018
HIGH RADIATION EXPOSURE TO MAGNAFLUX CORP. EMPLOYEE, JULY 13, 1965
MAGNAFLUX CORP., CHICAGO
1 PAGE- ATOMIC ENERGY CLEARING HOUSE 11(46)- 20 (NOVEMBER 15, 1965)- PDR

A RADIOGRAPHER WAS USING AN IRIIDIUM 192 DEVICE WITH WHICH HE WAS NOT FAMILIAR, AND FAILED TO RETURN THE SOURCE TO ITS SHIELDED POSITION. HIS RADIATION SURVEY DID NOT REVEAL THE UNSHIELDED SOURCE- EVEN WHEN HIS POCKET DOSIMETER REGISTERED OFF SCALE, HE MADE ANOTHER EXPOSURE. IN ADDITION, OPERATING INSTRUCTIONS WERE NOT KEPT WITH THE RADIOGRAPHIC DEVICE OR AT THE LOCATION.

ADMINISTRATIVE CONTROL + *FAILURE, OPERATOR ERROR + SOURCE, RADIATION + *PERSONNEL EXPOSURE, RADIATION

09278
WINTERS WR
OVEREXPOSURE AT MAGNAFLUX CORPORATION, MARCH 8, 1966
MAGNAFLUX CORPORATION, CHICAGO, ILLINOIS
2 PAGES, ATOMIC ENERGY CLEARING HOUSE, 12(16) PAGES 28-29, APRIL 18, 1966

A RADIOGRAPHER RECEIVED 3 REMS DURING A SETUP, WHILE HE WAS PLACING THE FILM. HIS ASSISTANT SET UP THE GAMMA CAMERA BUT FAILED TO CONNECT THE SOURCE TO THE DRIVE CABLE. THE ASSISTANT NOTICED THAT THE SOURCE LIGHTS WERE NOT INDICATING CORRECTLY, SO WORKED THE CONTROLS. THEN THE RADIOGRAPHER GOT A SURVEY METER, AND FOUND HE HAD BEEN RECEIVING AN EXPOSURE.

FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION

48245
THREE WORKERS OVEREXPOSED IN RADIOGRAPHY INCIDENT
MAGNAFLUX CORPORATION, CHICAGO, ILLINOIS
7 PAGE, LETTER - MAGNAFLUX CORPORATION TO DIVISION OF COMPLIANCE (AEC) - MARCH 27, 1970

ONE RECEIVED 4.5 R (WHOLE BODY), THE SECOND RECEIVED 8 R (WHOLE BODY) AND THIRD RECEIVED 8 R (WHOLE BODY), 350 R (LEFT HAND), AND 20 R (RIGHT HAND). RADIOGRAPHER WAS USING 74-CURIE SOURCE, IR-192. CAUSE - DISREGARDED RADIATION-SAFETY REGULATIONS. CORRECTIVE ACTION - ALL RADIOGRAPHERS MUST REVIEW AND FOLLOW SAFETY RULES.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + *FAILURE, OPERATOR ERROR

57466
OPERATOR RECEIVED EXPOSURE DUE TO WEAK SURVEY METER BATTERIES
MAGNAFLUX CORPORATION COMPLIANCE
1 PAGE, LETTER - MAGNAFLUX CORPORATION TO DIVISION OF COMPLIANCE (AEC) - OCTOBER 23, 1970

UPON DISASSEMBLY OF THE SOURCE TUBE FROM A CAMERA, THE 40-CURIE IR-192 SOURCE WAS SEEN IN THE UNSHIELDED POSITION. MONITORING OF THE CAMERA WAS EITHER DONE FROM THE OPPOSITE SIDE FROM THE PORT OPENING, OR THE METER WAS INOPERATIVE. EXPOSURE OF THE OPERATORS EXTREMITIES WAS CALCULATED TO BE 18.8 R. WEAK BATTERIES WERE FOUND IN THE SURVEY METER. SAFETY MEETING AND LECTURES WILL STRESS PROPER USE OF EQUIPMENT.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + *FAILURE, EQUIPMENT + FAILURE, OPERATOR ERROR + SOURCE, RADIATION + MONITORING SYSTEM, RADIATION + GENERATOR, BATTERY + SURVEY, RADIATION

26364
RADIOGRAPHY OVEREXPOSURE DUE TO FAILURE TO SURVEY
MATERIALS TESTING LAB, EAST HARTFORD, CONNECTICUT
2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATIONS FROM F.LENT, JULY 26, 1965

A RADIOGRAPHER RECEIVED A DOSE OF 1.74 REMS AS A RESULT OF FAILURE TO SURVEY AFTER COMPLETING AN EXPOSURE. THE SOURCE HAD NOT RETRACTED TO THE STORED POSITION IN THE CONTAINER. THE INCIDENT WAS DISCUSSED WITH ALL COMPANY RADIOGRAPHERS, AND AN AUDIBLE RADIATION ALARM WAS INSTALLED IN THE EXPOSURE ROOM.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

SOURCE, RADIATION + SURVEY, RADIATION + *PERSONNEL EXPOSURE, RADIATION + *INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR

26341
RESPONSE TO AEC CITATION FOR RADIOGRAPHY DEFICIENCIES
MATERIALS TESTING LAB, CHICAGO, ILLINOIS
2 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSEE RELATIONS FROM W.R. WINTERS, MARCH 22, 1966

COMPANY RESPONSE INCLUDED - (1) LICENSE IS TO BE MODIFIED TO ELIMINATE REQUIREMENT FOR A CONTROL DEVICE SINCE EXPOSURE ROOMS ARE TO BE UNDER CONSTANT SURVEILLANCE. (2) THE CALIBRATION OF SURVEY METERS AT REGULAR INTERVALS WAS RE-EMPHASIZED. (3) DAILY RECORDING OF DOSIMETER READINGS ARE NOW BEING MADE. (4) PERFORMANCE OF SURVEYS AFTER EXPOSURES WAS RE-EMPHASIZED.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*INSTRUMENT CALIBRATION + *FAILURE, ADMINISTRATIVE CONTROL

08669
MYERS DL

08669 *CONTINUED*
 RADIATION EXPOSURE AT MOBILE INSPECTION SERVICE, DECEMBER 19, 1965
 MOBILE INSPECTION SERVICES, INC., TULSA, OKLAHOMA
 1 PAGE- ATOMIC ENERGY CLEARING HOUSE 12(9)- 35 (FEBRUARY 28, 1966)

A DOSE OF 3.75 R WAS RECEIVED DURING 45 FILM EXPOSURES, AS THE GAMMA SOURCE DID NOT FULLY RETRACT INTO ITS SHIELD, THUS CAUSING AN 8 R/HR FIELD WHERE THE MAN WAS CHANGING FILM. APPARENTLY THE NON-RETRACTION WAS INTERMITTANT (OTHERWISE THE DOSE WOULD HAVE BEEN MUCH HIGHER) BEING CAUSED BY REPLACING THE DUST SHIELD BEFORE FULL RETRACTION, THUS KINKING THE CABLE. A RADIATION SURVEY WILL NOW BE MADE AFTER EACH EXPOSURE.

FAILURE, EQUIPMENT + SOURCE, RADIATION + *PERSONNEL EXPOSURE, RADIATION + *INCIDENT, NONREACTOR + *FAILURE, ADMINISTRATIVE CONTROL

41626
 NONCOMPLIANCE WITH BYPRODUCT MATERIAL LICENSE
 AEC, DIVISION OF COMPLIANCE
 3 PAGES, LETTER - AEC DIVISION OF COMPLIANCE TO MOBILE INSPECTION SERVICE, INC. - APRIL 21, 1969

INSPECTION IN MARCH 1969 REVEALED NONCOMPLIANCE ITEMS WERE - (1) INDIVIDUAL RECEIVED WHOLE-BODY EXPOSURE OF 1.4 REMS FOR FIRST QUARTER OF 1968, AND EXPOSURE WAS NOT REPORTED, (2) PERSONNEL MONITORING RECORDS WERE NOT PROPERLY MAINTAINED, (3) SURVEYS WERE NOT CONDUCTED TO DETERMINE RADIATION EXISTING IN UNRESTRICTED AREAS, (4) POCKET-DOSIMETER DOSES WERE NOT RECORDED ON A DAILY BASIS, AND (5) FILM BAGGES WERE NOT SUBMITTED FOR PROCESSING ON A WEEKLY BASIS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*PERSONNEL EXPOSURE, RADIATION + *RADIATION SAFETY AND CONTROL + *FAILURE, ADMINISTRATIVE CONTROL

65435
 LEAK OF CARBON-14 SOURCE
 NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, GREENBELT, MARYLAND 20771
 3 PAGES, LETTER FROM NATIONAL AERONAUTICS AND SPACE ADMINISTRATION TO U.S. ATOMIC ENERGY COMMISSION, MAY 20, 1971

AT NASA, A 25-MILLICURIE C-14 SOURCE OF SPECIAL DESIGN WAS BEING USED IN A VACUUM CHAMBER, WHEN A LEAK DEVELOPED. THE VACUUM CHAMBER WAS DECONTAMINATED, AS WAS THE FLOOR OUTSIDE THE CHAMBER. WORKER CONTAMINATION WAS LESS THAN 500 DPM/100 SQ CM. THE RAPID PRESSURE CHANGE IN THE TEST CHAMBER CAUSED THE LEAK.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*CARBON + *SOURCE, RADIATION + *LEAK + FAILURE, EQUIPMENT

26363
 RADIOGRAPHY INCIDENT AT NATIONAL TANK CO.
 NATIONAL TANK CO., TULSA, OKLAHOMA
 2 PAGES, LETTER TO E.R. PRICE OF THE DIVISION OF STATE AND LICENSEE RELATIONS FROM L.C. STARTS, SEPTEMBER 1, 1964

SEPARATION OF THE SOURCE CABLE AND TUBE ASSEMBLY OCCURRED ON AN EXPOSURE DEVICE. THIS WAS IMMEDIATELY DETERMINED SINCE THE OPERATOR HAD CRANKED 24 TURNS AND KNEW THAT IT REQUIRED ONLY 22. HE ATTEMPTED TO CRANK THE SOURCE BACK INTO THE SHIELD BUT COULD NOT. THE SOURCE WAS INSIDE A PRESSURE VESSEL, WHICH PROVIDED SOME SHIELDING. A NEW TUBE ASSEMBLY AND CABLE ASSEMBLY WERE INSTALLED ON THE UNIT. PERSONNEL EXPOSURES WERE 200, 160, 30, AND 10 MR.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

SOURCE, RADIATION + *INCIDENT, EQUIPMENT + *PERSONNEL EXPOSURE, RADIATION

26362
 LEAKING RADIOGRAPHY SOURCE CONTAMINATES EQUIPMENT
 NATIONAL TANK COMPANY, TULSA, OKLAHOMA
 2 PAGES, LETTER TO E.R. PRICE, AEC DIVISION OF STATE AND LICENSEE RELATIONS FROM F.L. SILVERS, JUNE 25, 1965

A RADIOGRAPHIC CAMERA AND SOURCE TUBE WERE FOUND TO BE CONTAMINATED FROM A LEAKING IRIIDIUM SOURCE. INTERCHANGING OF SOURCE TUBES HAD ALSO CONTAMINATED A COBALT SOURCE.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*SOURCE, RADIATION + *CONTAMINATION + INCIDENT, NONREACTOR

26333
 RESPONSE TO AEC CITATION FOR RADIOGRAPHY DEFICIENCIES
 NATIONAL TANK COMPANY, TULSA, OKLAHOMA
 2 PAGES, LETTER TO AEC, WASHINGTON, D. C. FROM F.L. SILVERS, JUNE 12, 1967

26333 *CONTINUED*

ON MARCH 12, 1967, A RADIOGRAPHER RECEIVED A DOSE OF 4550 MR (APPARENTLY FAILED TO SURVEY AND SOURCE DID NOT RETRACT). COMPANY RESPONSE TO AEC CITATION - (1) CALIBRATED AND OPERABLE SURVEY INSTRUMENTS WILL BE AVAILABLE AND USED AFTER EACH EXPOSURE, (2) APOLOGIZED FOR NOT INCLUDING EXPOSURE INFORMATION IN PREVIOUS LETTER, (3) LOG SHEET IMPROVED, (4) RADIOGRAPHERS INSTRUCTED TO MAKE SURVEYS AT BEGINNING AND END OF EACH SHIFT (IN ADDITION TO OTHER SURVEYS REQUIRED BY PROCEDURES), AND (5) A NEW SURVEY INSTRUMENT WITH AUDIBLE-SIGNAL ATTACHMENT WAS PURCHASED.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, OPERATOR ERROR + SOURCE, RADIATION + *PERSONNEL EXPOSURE, RADIATION + INCIDENT, NONREACTOR

26361

RADIOGRAPHY EXPOSURE DUE TO IMPROPER SURVEY
NEWPORT NEWS SHIPBUILDING AND DRYDOCK COMPANY, NEWPORT NEWS, VIRGINIA
1 PAGE, NEWPORT NEWS SHIPBUILDING CO. LAB REPORT NO. 2473A, OCTOBER 12, 1964

RADIOGRAPHER RECEIVED A RADIATION DOSE OF 5.25 REMS FROM A 9-CURIE IRIIDIUM-192 SOURCE AS A RESULT OF FAILING TO MAKE A PROPER SURVEY TO ASCERTAIN THAT SOURCE HAD RETURNED TO A SAFE POSITION IN THE SHIELD.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

SOURCE, RADIATION + SURVEY, RADIATION + PERSONNEL EXPOSURE, RADIATION + *INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR

28066

MOBERG AJ
RADIATION EXPOSURES AT NEWPORT NEWS SHIPBUILDING CO., NEWPORT NEWS, VIRGINIA
NEWPORT NEWS SHIPBUILDING AND DRY DOCK CO.
2 PAGES- OCTOBER 27, 1965, ATOMIC ENERGY CLEARING HOUSE 11(50)- 30-31 (DECEMBER 13, 1965)- PDR

3.8 REM WAS RECEIVED IN ONE QUARTER BY ONE INDIVIDUAL, PRIMARILY AS HE WAS SECURING MALFUNCTIONING RADIOGRAPHIC EQUIPMENT. THE EQUIPMENT HAS BEEN REPAIRED, AND MODIFICATION MADE TO PERMIT RAISING THE SOURCE TUBE WITHOUT ENTERING THE EXPOSURE BOOTH.

*FAILURE, EQUIPMENT + SOURCE, RADIATION + INCIDENT, EQUIPMENT + MODIFICATION + *PERSONNEL EXPOSURE, RADIATION

26360

RADIOGRAPHY EXPOSURE DUE TO IMPROPER SURVEY
NEWPORT NEWS SHIPBUILDING AND DRYDOCK COMPANY, NEWPORT NEWS, VIRGINIA
1 PAGE, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM G.S. BARLOW, JUNE 15, 1966

ON JUNE 1, 1966, BETWEEN TWO THIRTY AND FOUR THIRTY AM, A RADIOGRAPHER AT NEWPORT NEWS SHIPBUILDING CO. RECEIVED A WHOLE-BODY DOSE OF 1.765 REMS. CIRCUMSTANTIAL EVIDENCE INDICATED THAT A PROPER SURVEY WAS NOT MADE AT THE END OF AN EXPOSURE TO ASCERTAIN THAT THE SOURCE HAD RETURNED TO A SAFE POSITION.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

SOURCE, RADIATION + SURVEY, RADIATION + PERSONNEL EXPOSURE, RADIATION + *INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR

29810

MOBERG AJ
LOSS OR THEFT OF RADIOACTIVE SOURCE, 0.0325 CURIES OF COBALT 60 DISCOVERED JULY 9, 1968
NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY, NEWPORT NEWS, VIRGINIA
H-4089 +. JULY 22, 1968

ON JULY 9, 1968, IT WAS DISCOVERED THAT A 32.5-MILLICURIE CC-60 SOURCE (EMITTING 450 MR/HR AT 1 FOOT) WAS MISSING. ENSUING INVESTIGATION REPORTED. THE SCREEN PLUG WAS DELIBERATELY OR ACCIDENTALLY REMOVED FROM THE EXPOSURE DEVICE, PERMITTING SOURCE TO BECOME LOST. OVER 250 MAN-HOURS SPENT UNSUCCESSFULLY SEARCHING FOR SOURCE. COMPANY ACKNOWLEDGED LAXITY ON PART OF PERSONNEL TO SURVEY CONTAINERS OF LOW-STRENGTH SOURCES. SEVERAL ENCLOSURES OF NEWSPAPER NOTICES, INVESTIGATIVE REPORTS, AND PICTURES OF CONTAINERS AND EXPOSURE DEVICE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D. C. 20545, (\$0.25 CENTS/PAGE)

*CORALT + RADIATION SAFETY AND CONTROL + INCIDENT, HUMAN ERROR + *INCIDENT, NONREACTOR + *SOURCE, RADIATION, LOST + FAILURE, ADMINISTRATIVE CONTROL

26359

LOOSE SCREW ON RADIOGRAPHY EQUIPMENT RESULTS IN EXPOSURES
NEW YORK SHIPBUILDING CORPORATION, CAMDEN, NEW JERSEY
3 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM E.P. ANDERSON, NOVEMBER 15, 1963

FIVE INDIVIDUALS RECEIVED RADIATION EXPOSURES - 1.2 R, 1.2, 280 MR, 130 MR, 90 MR - WHEN AN ALLEN

26359 *CONTINUED*

SET-SCREW ON THE SOURCE DISCONNECT WORKED LOOSE AND CAUSED THE SOURCE TO STICK IN THE SOURCE TUBE ABOUT 2 FT OUT FROM THE SHIELD. THE SOURCE WAS REMOVED BY CUTTING OFF THE OUTBOARD END OF THE SOURCE TUBE AND PLACING THE OPEN END, CONNECTED TO THE CAMERA, INTO A LEAD BALL. THE SOURCE WAS THEN CRANKED OUT INTO THE LEAD BALL AND DISCONNECTED FROM THE OPERATING CABLE. ALL SUPERVISORS WERE INSTRUCTED TO PERIODICALLY CHECK THE DISCONNECTS.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

SOURCE, RADIATION + *INCIDENT, EQUIPMENT + *PERSONNEL EXPOSURE, RADIATION + INCIDENT, RECOVERY FROM

17372

NORTH AMERICA INSPECTION SERVICES CITED FOR RADIOGRAPHY OVEREXPOSURE

NORTH AMERICAN INSPECTION SERVICES, INC.

3 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(34), PAGES 31 THRU 33, (AUGUST 21, 1967)

(LETTER, JUNE 28) NAIS WAS CITED JUNE 28 UNDER LICENSE 29-8122-1 FOR A FEBRUARY 14 EXPOSURE IN ALASKA. (1) EMPLOYEE FAILED TO CONDUCT A SURVEY AFTER EACH EXPOSURE, AND WHEN THE DEVICE MALFUNCTIONED, RECEIVED 11 REMS. (2,3) DID NOT PROCESS FILM BADGE OR EVALUATE EXPOSURE WHEN THE DOSIMETER WAS FOUND TO BE OFF SCALE. (4,5,6) EMERGENCY PROCEDURES WERE NOT FOLLOWED, AND AEC WAS NOT NOTIFIED. (7-11) RECORDS WERE NOT KEPT, SITE AND DEVICES WERE NOT POSTED. (REPLY JULY 11) (2-3) FIELD ESTIMATE OF DOSE WAS IN THE REGION OF 1 R, AND REPLACEMENT BADGE WAS NOT AVAILABLE. (4-5) EMPLOYEE DISCONNECTED PIPELINE CONTROL CABLE, REPORTED TO SUPERVISOR WHO FOUND SOURCE IN THE SAFE POSITION. (6) TWO BRANCHES ASSUMED OTHER HAD REPORTED INCIDENT.

*FAILURE, EQUIPMENT + FAILURE, OPERATOR ERROR + *INCIDENT + *PERSONNEL EXPOSURE, RADIATION

47196

RADIOGRAPHER RECEIVES 300-MILLIREM WHOLE-BODY DOSE FROM IR-192 SOURCE

NORTH AMERICAN INSPECTION SERVICES

2 PAGES, LETTER - NORTH AMERICAN INSPECTION SERVICES TO DIVISION OF COMPLIANCE (AEC) - AUGUST 14, 1969

DOSE RECORDED ON FILM BADGE INDICATES A TOTAL EXPOSURE OF 300 MR. BADGE WAS WORN IN HIS LEFT FRONT PANTS POCKET. RADIOGRAPHER WAS USING THE AIR CAMERA PHASE OF THIS EQUIPMENT. WAS CALLED TO ANOTHER LOCATION AND TOLD TO HURRY AS A CREW WAS WAITING UNTIL HE COMPLETED HIS WORK. FAILED TO REASSEMBLE THE CAMERA PROPERLY. CLAIMS TO HAVE CHECKED THE CAMERA WITH A SURVEY METER PRIOR TO LEAVING THE FIRST WORK LOCATION AND UPON HIS ARRIVAL AT THE SECOND LOCATION. REPORTS NO ABNORMAL SURVEY METER READINGS INDICATING, THAT THE SOURCE, HAD REMAINED IN A SAFE POSITION. THE CRANK-OUT PHASE WAS USED AT THE SECOND LOCATION. CRANK FAILED TO STOP IN THE NORMAL POSITION AND OPERATOR CONTINUED TO CRANK EXTENDING THE CABLE OUT OF THE CAMERA. AT THIS POINT, OPERATOR SAYS HE REALIZED THAT THE SOURCE COULD NO LONGER BE IN THE CAMERA.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + *IRIDIUM + *FAILURE, OPERATOR ERROR

47194

RADIOGRAPHER RECEIVES 1442-MILLIRCENTGEN DOSE FROM IR-192 SOURCE

NORTH AMERICAN X-RAY DIVISION, BUCKEYE PIPE LINE COMPANY, PENNSYLVANIA

2 PAGES, LETTER - NORTH AMERICAN X-RAY TO DIVISION OF COMPLIANCE (AEC) - AUGUST 2, 1969

ATTEMPTED TO ADJUST SOURCE TUBE SO IT COULD BE RETURNED TO ITS SHIELD. CORRECTIVE ACTION - CAUTIONED RADIOGRAPHERS TO CONSULT WITH RADIATION OFFICER TO HELP ENSURE GOOD SHIELDING BEFORE ATTEMPTING ANY SUCH WORK.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + *FAILURE, OPERATOR ERROR + IRIDIUM

42025

TECHNICIAN AND HELPER RECEIVED OVERDOSE FROM FAULTY RADIOGRAPHIC DEVICE

AEC, DIVISION OF COMPLIANCE

1 PAGE, LETTER TO NORTH AMERICA X-RAY DIVISION FROM DIVISION OF COMPLIANCE, JANUARY 16, 1970

A 57-CURIE IRIDIUM SOURCE WAS USED TO RADIOGRAPH WELDS IN A FABRICATING YARD NEAR BARRINGTON, MICHIGAN. UPON COMPLETION OF EXPOSURE, SOURCE WOULD NOT RETURN TO STORED POSITION. THE ENTIRE CAMERA (SHIELDED STORAGE DEVICE) WAS DRAGGED BY CABLE INTO DEEP GULLEY AND AREA ROPED OFF AND GUARDED UNTIL ASSISTANCE ARRIVED FROM PA. HOME OFFICE. THE SOURCE WAS THEN RETURNED TO CAMERA AND SECURED. THE CONNECTOR ON DRIVE CABLE WAS DEFECTIVE OR BROKEN, SO ENTIRE UNIT SHIPPED FOR REPAIR. TECHNICIAN AND HELPER RECEIVED 1064 AND 2320 MR, RESPECTIVELY. TWO OTHER EMPLOYEES WERE DISCHARGED FOR FAILURE TO COMPLY WITH SAFE OPERATING PROCEDURES.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, EQUIPMENT + PERSONNEL EXPOSURE, RADIATION + *IRIDIUM + FAILURE, OPERATOR ERROR + CONTROL SYSTEM

00715
INDICATED PERSONNEL EXPOSURES
NORTH AMERICAN X-RAY, ALLENTOWN, PA
12 PAGES, LETTER - NORTH AMERICAN X-RAY CORPORATION TO CHIEF MATERIALS INSPECTION AND ENFORCEMENT (AEC) -
MARCH 1970

THERE WERE 12 LETTERS EXPLAINING INDICATED HIGH READINGS OF FILM BADGES. ALL OF THEM INVOLVED
MISHANDLING OF BADGES - FROM LEAVING THEM ON COLOR TELEVISION TO WEARING THEM DURING DENTAL X-RAY
EXAMS, DROPPING BADGES NEAR SOURCE, ETC. SEVERAL HAC READINGS RESULTED FROM NOT FOLLOWING PROPER
PROCEDURES. TWO QUARTERLY EXPOSURES (1.43 REMS AND 2.01 REMS) RESULTED FROM NOT BEING ABLE TO
GET FAR ENOUGH AWAY FROM THE SOURCE WHILE WORKING IN A CONFINED SPACE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN.
CHARGE)

RADIATION EXPOSURE + MONITOR, PERSONNEL + *PERSONNEL EXPOSURE, RADIATION + *FAILURE, OPERATOR ERROR + SOURCE,
RADIATION + *PROCEDURES AND MANUALS

43249
DOSIMETER READING AND FILM BADGE RECORD DISAGREE
NORTH AMERICAN X-RAY, ALLENTOWN, PA.
1 PAGE, LETTER TO THE DIVISION OF COMPLIANCE (AEC) FROM NORTH AMERICAN X-RAY, MARCH 3, 1970

AN INDIVIDUAL WORKING WITH RADIATION SOURCE CARRIED BOTH A FILM BADGE AND A SELF-READING
DOSIMETER. THE FILM BADGE RECORDED AN OVEREXPOSURE (5640 MR) FOR DECEMBER 1969, WHEREAS HIS
DOSIMETER READING WAS ONLY 112 MR. SIMILARLY, IN OCTOBER AND NOVEMBER, THE FILM-BADGE RECORD
WAS HIGHER THAN THE DOSIMETER READING. HOWEVER, THE RADIATION SAFETY OFFICER STATES THAT HE HAS
REASON TO DOUBT READING OF FILM BADGE WAS THE REASON FOR DISCREPANCY DETERMINED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN.
CHARGE)

*DOSE MEASUREMENT, EXTERNAL + PERSONNEL EXPOSURE, RADIATION + *RADIATION EXPOSURE, RECORD KEEPING + FAILURE,
OPERATOR ERROR + MONITOR, PERSONNEL

60843
NORTH AMERICAN X-RAY CITED FOR NONCOMPLIANCE
NORTH AMERICAN X-RAY CORPORATION, PENNSYLVANIA
1 PAGE, LETTER FROM DIVISION OF COMPLIANCE (USAEC) TO NORTH AMERICAN X-RAY CORPORATION, NOVEMBER 13, 1970

NORTH AMERICAN X-RAY CITED FOR 16 ITEMS OF NONCOMPLIANCE. SOME OF WHICH INCLUDE THE FOLLOWING -
EVALUATION OF 6 OVEREXPOSURES NOT MADE, PROPER LETTERS NOT WRITTEN, RECORDS NOT KEPT OF HIGH
EXPOSURES, REPORTS ON EXPOSURES FOR MEN TERMINATING WERE NOT SUBMITTED, PROPER RADIATION SURVEYS
NOT MADE, QUARTERLY INVENTORIES NOT CONDUCTED, POCKET DOSIMETERS NOT ALWAYS READ AND RECORDED ON
DAILY BASIS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN.
CHARGE)

*PERSONNEL EXPOSURE, RADIATION + *FAILURE, ADMINISTRATIVE CONTROL + SOURCE, RADIATION + RADIATION EXPOSURE,
RECORD KEEPING + SURVEY, RADIATION + FAILURE, OPERATOR ERROR

61900
POSSIBLE RADIATION EXPOSURE AT NORTH AMERICAN X-RAY
NORTH AMERICAN X-RAY CORPORATION, NEW YORK
1 PAGE, TX - NORTH AMERICAN X-RAY TO DIVISION OF COMPLIANCE (AEC) - JANUARY 6, 1971

A POSSIBLE RADIATION EXPOSURE OCCURRED AT NORTH AMERICAN X-RAY FROM A SOURCE DISCONNECT. FACTS
ARE BEING GATHERED. A RADIATION CONSULTANT WAS SENT TO INVESTIGATE. THE SOURCE WAS IR-192,
ABOUT 83 CURIES.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN.
CHARGE)

*FAILURE, EQUIPMENT + *PERSONNEL EXPOSURE, RADIATION + *X-RAY

61901
NINE HIGH FILM BADGE READINGS REPORTED BY NORTH AMERICAN X-RAY
NORTH AMERICAN X-RAY
1 PAGE, LETTER - NORTH AMERICAN X-RAY TO DIVISION OF COMPLIANCE (AEC) - NOVEMBER 13, 1970

NINE HIGH FILM-BADGE READINGS WERE REPORTED FOR THE MONTHS OF JULY, AUGUST, AND SEPTEMBER.
READINGS RANGED FROM 750 TO 4300 MR FOR A ONE-MONTH PERIOD. IT HAS NOT BEEN DETERMINED YET
WHETHER THE EXPOSURE WAS TO THE BADGE ONLY OR TO THE BADGE AND THE PERSON. SIX PEOPLE INVOLVED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN.
CHARGE)

61901 *CONTINUED*
 *MONITOR, PERSONNEL + *PERSONNEL EXPOSURE, RADIATION

63693
 NORTH AMERICAN X-RAY, INC. REPORTS POSSIBLE EXPOSURE OF RADIOGRAPHER TO IR-192
 ATOMIC ENERGY COMMISSION
 6 PAGES, LETTER TO DIVISION OF COMPLIANCE FROM NORTH AMERICAN X-RAY, INC., ALLENTOWN, PA. 18103, FEBRUARY 2, 1971

RADIOGRAPHER A CRANKED AN 83-CI IR-192 SOURCE OUT FIVE TIMES BEFORE DISCOVERING THAT ON THE SIXTH CRANK-OUT THE SOURCE HAD STUCK IN AN EXPOSED POSITION. NOW BELIEVE THAT BEFORE THE RADIOGRAPHER ACTUALLY BECAME AWARE OF THIS CONDITION, THE SOURCE HAD DISCONNECTED. WHILE NO FACTUAL INFORMATION HAS BEEN OBTAINED TO VERIFY THE ACTUAL TIME OR POINT AT WHICH THE SOURCE BECAME DISCONNECTED, THE ASSUMPTIONS MADE IN THIS REPORT ARE BASED UPON THE BEST AVAILABLE INFORMATION AT THIS TIME AND APPEAR TO BE CONSISTENT WITH THE MEDICAL FINDINGS RESULTING FROM A PROMPT AND THOROUGH CLINICAL EVALUATION OF THE RADIOGRAPHER.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + *SOURCE, RADIATION + FAILURE, EQUIPMENT

14262
 RADIATION INCIDENT AT NUCLEAR FUEL SERVICE PLANT CONSTRUCTION, APRIL 5, 1965
 NUCLEAR FUEL SERVICES
 1 PAGE, ATOMIC ENERGY CLEARING HOUSE 11(22), PAGE 35 (MAY 24, 1965)

TWO RADIOGRAPHERS WERE SHARING THE DUTY INVOLVED IN HAND-CRANKING A RADIOGRAPHY SOURCE IN AND OUT OF ITS SHIELD. ONE ALWAYS CRANKING IT OUT, THE OTHER CRANKING IT IN. WHEN ONE WAS CALLED AWAY, THE ASSISTANT BEGAN TO CRANK IT FOR BOTH JOURNEYS. HOWEVER HE ASSUMED THAT THE SOURCE HAD BEEN ALREADY CRANKED OUT BY THE OTHER, WHEN IN FACT IT WAS STILL IN THE SHIELD. THEREFORE THE ASSISTANT CRANKED THE SOURCE OUT OF THE SHIELD INSTEAD OF IN AFTER EACH EXPOSURE, AND WAS OVEREXPOSED WHEN HE WENT TO CHANGE THE FILM. DESPITE THE RULES, HE FAILED TO CHECK RADIATION READINGS AFTER EACH SOURCE MOVEMENT. MAXIMUM DOSE ESTIMATIONS WERE APPROXIMATELY 67 REMS (R HAND), 7 REMS (L HAND), 3.4 REMS (WHOLE BODY).

*ADMINISTRATIVE CONTROL + SOURCE, RADIATION + PERSONNEL EXPOSURE, RADIATION + ACCIDENT, NONREACTOR + *INCIDENT, HUMAN ERROR

26315
 RADIATION CONTROL DEVICE FOR RADIOGRAPHY ROOM
 PARKER INDUSTRIAL X-RAY CORP., NEW HAVEN, CONNECTICUT
 1 PAGE, LETTER TO AEC DIVISION STATE AND LICENSEE RELATIONS FROM P.J. ROSENBAUM, NOVEMBER 30, 1964

COMPANY RESPONSE TO AEC CITATION IS THAT THE AREA MONITOR FOR THE RADIOGRAPHY ROOM HAS BEEN REPAIRED. COMPANY DISAGREES WITH AEC RECOMMENDATION FOR CALIBRATION OF THE SURVEY METER AND REQUESTS AEC TO INDICATE IF THE CALIBRATION POINTS ARE SUGGESTED OR MANDATORY.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*INSTRUMENT, RADIATION MONITORING + *PERSONNEL PROTECTIVE DEVICE + INSTRUMENT CALIBRATION

26316
 RADIATION CONTROL DEVICE FOR RADIOGRAPHY ROOM
 U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
 1 PAGE, LETTER TO PARKER INDUSTRIAL X-RAY LABORATORY FROM E.R. PRICE, JANUARY 4, 1965

AEC AGAIN REQUESTS THAT COMPANY SPECIFY STEPS TAKEN TO ENSURE THAT RADIOGRAPHY WILL BE CONDUCTED IN ROOM ONLY WHEN IT IS EQUIPPED WITH AN OPERABLE CONTROL DEVICE. ALSO, THE SURVEY INSTRUMENT SHOULD BE CALIBRATED BY CHECKING AT LEAST TWO POINTS ON THE SCALE. THIS WILL BE A REQUIREMENT WHEN THE LICENSE IS RENEWED.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*INSTRUMENT, RADIATION MONITORING + *PERSONNEL PROTECTIVE DEVICE + *INSTRUMENT CALIBRATION

26317
 RADIATION CONTROL DEVICE FOR RADIOGRAPHY ROOM
 PARKER INDUSTRIAL X-RAY, NEW HAVEN, CONNECTICUT
 1 PAGE, LETTER TO AEC DIVISION OF STATE AND LICENSEE RELATIONS FROM P.J. ROSENBAUM, JANUARY 11, 1965

COMPANY RESPONSE TO AEC CITATION FOR LACK OF OPERABLE RADIATION CONTROL DEVICE IN RADIOGRAPHY ROOM STATED THAT (1) DOOR TO ROOM IS EQUIPPED WITH A BAR ACROSS IT TO PREVENT ACCIDENTAL ACCESS, (2) AN AREA MONITOR MONITORS THE RADIATION LEVEL NEAR THE ENTRANCE TO THE ROOM WHENEVER RADIOGRAPHY IS PERFORMED IN THE ROOM, AND (3) IF THE PILL FAILS TO RETURN TO THE POT WHEN THE SAFE LIGHT FLASHES, THE AREA MONITOR WOULD INDICATE THIS FACT WHEN THE DOOR IS OPENED. THE MONITOR IS CONSIDERED AS A CONTROL.

26317 *CONTINUED*
USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*INSTRUMENT, RADIATION MONITORING + PERSONNEL PROTECTIVE DEVICE

26318
RADIATION CONTROL DEVICE FOR RADIOGRAPHY ROOM
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
2 PAGES, LETTER TO PARKER INDUSTRIAL X-RAY LABORATORY FROM E.R. PRICE, MARCH 23, 1965

CLARIFIES STATEMENTS MADE BY COMPANY CONCERNING THE CONTROL DEVICE (AREA MONITOR). REGULATIONS STATE THAT THE DEVICE SHALL EITHER CAUSE THE RADIATION LEVEL TO BE REDUCED WHEN AREA ENTRY OCCURS OR SHALL ENERGIZE A CONSPICUOUS OR AUDIBLE ALARM SUCH THAT THE INDIVIDUAL ENTERING AND THE LICENSEE ARE MADE AWARE OF THE ENTRY. COMPANY CONSIDERS THE AREA MONITOR AS A CONTROL, AND IT WAS REPAIRED AND OPERATING WITHIN A WEEK AFTER INSPECTION FOUND IT INOPERATIVE.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*INSTRUMENT, RADIATION MONITORING + *PERSONNEL PROTECTIVE DEVICE + *MONITOR, AREA

24820
SCHRCEDER AW
COMPLIANCE CITATION OF PETRO-CHEM. CORP.
PETRO-CHEM ENGINEERING CORP., CHICAGO, ILL.
3 PAGES, ATOMIC ENERGY CLEARING HOUSE, 14(15), PAGES 36-38 (APRIL 8, 1968)

(LETTER, JAN. 24) INSPECTION NOV. 17, 1967, AT CITIES SERVICE REFINERY (CHICAGO, ILL.) REVEALED 7 ITEMS (RADIATION OUTSIDE TRAILER GREATER THAN 2 MR/HR, OUTSIDE OF RADIOGRAPHY SHIELD GREATER THAN 500 MR/HR). INSPECTION SEPT. 20, 1967, AT HOUSTON, TEX., REVEALED 8 MORE (RECORDS WERE INCOMPLETE, UNLICENSED DEVICES WERE USED, FILMS WERE NOT USED, INSTRUMENTS NOT CALIBRATED). *** NUMBER AND NATURE OF NONCOMPLIANCE ITEMS INDICATE INADEQUATE MANAGEMENT CONTROL OVER SAFETY.

*FAILURE, ADMINISTRATIVE CONTROL

26358
CITATION FOR DEFICIENCIES IN RADIOGRAPHY PROCEDURES
PIPEWELD X-RAY CORP., PERRYSBURG, OHIO
3 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM C. EARLE, FEBRUARY 19, 1964

AN INSPECTION ON OCT. 22, 1963, RESULTED IN CITATION. PIPEWELD CO. RESPONDED THAT DEFICIENCIES RESULTED BECAUSE PEOPLE FORGET ITEMS REQUIRED BY AEC. CITED FOR (1) RADIOGRAPHER NOT WEARING A FILM BADGE, (2) POOR RECORD KEEPING, (3) FAILURE TO MAKE PROPER SURVEYS, (4) FAILURE TO POST RADIATION SIGNS, AND (5) FAILURE TO POST RECORD OF JOB-SITE SURVEY.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

FAILURE, OPERATOR ERROR + *FAILURE, ADMINISTRATIVE CONTROL

26357
RADIOGRAPHY OVEREXPOSURES FOR CALENDAR QUARTER
PIPEWELD X-RAY CORP., PERRYSBURG, OHIO
2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM C. EARLE, JR., JULY 22, 1964

REPORTS THAT SIX RADIOGRAPHERS RECEIVED EXPOSURES FOR QUARTER EXCEEDING 1.25 REMS. MAXIMUM WAS 2.25 REMS. ONE RADIOGRAPHER HAD BEEN LEAVING HIS CLOTHES (AND BADGE) ON A STEAM RADIATOR AT NIGHT. ANOTHER OVERDOSE WAS ATTRIBUTED TO INACCURATE FILM-BADGE READINGS BECAUSE OF A PARTIALLY OBLITERATED FILM.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION + *FAILURE, ADMINISTRATIVE CONTROL

26325
CITATION FOR DEFICIENCIES IN RADIOGRAPHY PROCEDURES
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D. C.
2 PAGES, LETTER TO PIPEWELD X-RAY CORPORATION FROM E.R. PRICE, JANUARY 28, 1965

AEC INSPECTIONS RESULTED IN CITATIONS FOR (1) NOT PROVIDING RADIOGRAPHERS WITH COPIES OF AEC LICENSE, (2) ALLOWING OPERATIONS BY 3 RADIOGRAPHERS WHO WERE UNABLE TO READ A SURVEY METER CORRECTLY, (3) FAILURE OF RADIOGRAPHERS TO PERFORM RADIATION SURVEY AFTER EXPOSURES, AND (4) EMPLOYEES NOT KNOWING AEC REGULATIONS.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

FAILURE, OPERATOR ERROR + TRAINING + *FAILURE, ADMINISTRATIVE CONTROL

26355
 RESPONSE TO AEC CITATION FOR RADIOGRAPHY DEFICIENCIES
 PIPEWELD X-RAY CORPORATION, PERRYSBURG, OHIO
 3 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSEE RELATIONS FROM C. EARLE, JR., FEBRUARY 14, 1966

COMPANY RESPONSE TO CITATIONS - (1) RADIOGRAPHERS DID NOT HAVE A COPY OF THE AEC LICENSE BECAUSE OF OVERSIGHT. (2) INABILITY OF 3 RADIOGRAPHERS TO READ A SURVEY METER CORRECTLY WAS CAUSED BY EMPLOYEES BECOMING EXCITED AND HIGHLY NERVOUS WHEN CONFRONTED BY AN AEC REPRESENTATIVE AND FAILING TO CHECK THE METER-SCALE SETTING. (3) THOSE WHO FAILED TO SURVEY AFTER EXPOSURES WERE FINED. EMPLOYEES WERE REINSTRUCTED IN REQUIREMENTS OF AEC REGULATIONS AND COMPANY OPERATING MANUAL.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

FAILURE, OPERATOR ERROR + *SURVEY, RADIATION + *FAILURE, ADMINISTRATIVE CONTROL

26366
 CITATION FOR DEFICIENCIES IN RADIOGRAPHY PROCEDURES
 UNITED STATES ATOMIC ENERGY COMMISSION
 2 PAGES, LETTER TO PIPEWELD X-RAY CORPORATION FROM E.R. PRICE, JANUARY 13, 1967

CITED FOR (1) ALLOWING RADIOGRAPHY BY PERSONS NOT INSTRUCTED IN PROCEDURES NOR SHOWN USE OF DEVICES, (2) POOR RECORD KEEPING, AND (3) FAILURE TO SURVEY AFTER EXPOSURES. AEC NOTED THAT ONE RADIOGRAPHER HAD A COPY OF THE QUESTIONS AND ANSWERS TO THE COMPANY'S RADIOGRAPHY EXAMINATION. ITEMS 2 AND 3 ARE VIOLATIONS WHICH HAVE BEEN CITED IN PREVIOUS INSPECTIONS, AND THE REASON FOR THEIR RECURRENCE SHOULD BE IDENTIFIED.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

FAILURE, OPERATOR ERROR + *FAILURE, ADMINISTRATIVE CONTROL

26356
 RESPONSE TO AEC RADIOGRAPHY CITATION
 PIPEWELD X-RAY CORPORATION, PERRYSBURG, OHIO
 5 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSEE RELATIONS FROM C. EARLE, JR., JANUARY 30, 1967

IN THE FUTURE, PERSONNEL WILL SIGN A STATEMENT THAT THEY HAVE RECEIVED INSTRUCTION ON COMPANY RADIOGRAPHY PROCEDURES. PERSON HAVING COPY OF RADIOGRAPHERS TEST QUESTIONS AND ANSWERS HAD GOTTEN AN OLDER RADIOGRAPHER TO WRITE THEM OUT FROM MEMORY TO ASSIST HIM IN STUDYING TO CHANGE HIS CLASSIFICATION (REPRESENTED LESS THAN 1/2 OF TEST QUESTIONS). RECURRING VIOLATIONS - FAILURE TO SURVEY AFTER EXPOSURE AND RECORD KEEPING OCCUR BECAUSE AEC DID NOT DIRECT THE CITATIONS TO THE RADIOGRAPHER BUT TO THE COMPANY. ADVOCATES THAT AEC LICENSE (NOT COMPANY) INDIVIDUAL SO THAT THREAT OF REVOCATION WOULD ELIMINATE RADIOGRAPHER LAXITY IN FOLLOWING PROCEDURES.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

FAILURE, OPERATOR ERROR + TRAINING + *RADIATION SAFETY AND CONTROL + *FAILURE, ADMINISTRATIVE CONTROL

28850
 WEISNER WJ
 TWO RADIOGRAPHY INCIDENTS
 PITTSBURGH-DES MOINES STEEL COMPANY
 LETTER TO DIRECTOR, DIV. OF STATE AND LICENSEE RELATIONS, USAEC, WASHINGTON, JULY 19, 1968

TRANSMITS LETTER TO INDIVIDUALS CONCERNED. (1) ON 18 DEC. 1967, AN EMPLOYEE ON NIGHT SHIFT, WORKING ON LAST EXPOSURE AND IN A HURRY TO COMPLETE BREAKDOWN, DID NOT TAKE A SECOND LOOK AND FOUND DRIVE CABLE IN SOURCE TUBE. HE RECEIVED 4.98 REMS, AND HIS ASSISTANT 0.463. HE VIOLATED 3 PROCEDURES. (2) EARLY IN 1968, AN EMPLOYEE RADIOGRAPHING ON NIGHT SHIFT FOUND SOURCE STUCK BECAUSE OF A KINKED GUIDE TUBE. IN DISLODGING THE SOURCE, HE RECEIVED 1.033 REMS AND HIS ASSISTANT 0.094. NO PROCEDURE VIOLATIONS.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

FAILURE, OPERATOR ERROR + INCIDENT, EQUIPMENT + *PERSONNEL EXPOSURE, RADIATION

40743
 RADIOGRAPHER RECEIVES RADIATION EXPOSURE IN EXCESS OF MPL FOR QUARTER
 PITTSBURGH-DES MOINES STEEL COMPANY
 2 PAGES, REPORT OF RADIATION EXPOSURE, OCTOBER 20, 1969

DURING 1ST QUARTER OF 1969, THE RADIOGRAPHER RECEIVED 44 MREMS OF RADIATION IN EXCESS OF 10 CFR 20. DURING THIS PERIOD HE WAS WORKING WITH IR-192 AND X-RAY MACHINES. EACH TIME HE RECEIVED A WEEKLY EXPOSURE GREATER THAN 100 MREM, THE CONDITIONS WERE REVIEWED WITH HIS IMMEDIATE SUPERVISOR AND THE REASONS RESOLVED. SINCE THEN, NO EXCESS READINGS OF HIS FILM BADGE HAVE OCCURRED. BY MAINTAINING RECORD OF FILM-BADGE READINGS AND THOROUGH REVIEW OF CONDITIONS, EXPOSURES WERE REDUCED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

40743 *CONTINUED*

*PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + *IRIDIUM + RADIATION EXPOSURE, RECORD KEEPING

40741

FILM BADGE SHOWS OVEREXPOSURE RECEIVED WHILE RADIOGRAPHING WELDS
AEC, DIVISION OF COMPLIANCE
3 PAGES, LETTER TO PITTSBURGH-DES MOINES STEEL COMPANY, NOVEMBER 25, 1969

TOTAL RADIATION (BASED ON FILM-BADGE READINGS) RECEIVED DURING FIRST 3 MONTHS OF 1969 WERE IN EXCESS OF 10 CFR, PART 20. COMMISSION HAS ESTABLISHED A CENTRAL REPOSITORY FOR THE RECORDING OF INDIVIDUAL OCCUPATIONAL RADIATION EXPOSURE INFORMATION. REPORTING ORGANIZATIONS ARE REQUESTED TO GIVE SOCIAL-SECURITY NUMBER OF THE INDIVIDUALS INVOLVED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

PERSONNEL EXPOSURE, RADIATION + RADIATION EXPOSURE, RECORD KEEPING

26354

RADIOGRAPHY EQUIPMENT MALFUNCTION
PITTSBURGH TESTING LABORATORY, PITTSBURGH, PENNSYLVANIA
2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM H.F. HEDDERICH, DECEMBER 19, 1963

A MALFUNCTION IN A RADIOGRAPHIC DEVICE RESULTED IN AN EXPOSURE DOSE OF 95 MR. AN INTERLOCKING HOUSING SCREW WORKED LOOSE SO THAT WHEN THE EMPLOYEE STARTED TO CRANK OUT THE SOURCE, IT PULLED OUT OF THE BACK END OF THE DEVICE. THE PERSONNEL MOVED A SAFE DISTANCE AWAY, DECIDED ON A COURSE OF ACTION, AND REPLACED THE SOURCE INTO THE DEVICE.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*INCIDENT, EQUIPMENT + PERSONNEL EXPOSURE, RADIATION + *INCIDENT, NONREACTOR

26392

THIRD DEGREE BURNS SUSTAINED FROM RADIOGRAPHY INCIDENT
PITTSBURGH TESTING LAB, BIRMINGHAM, ALABAMA
2 PAGES, LETTER TO AEC DIV. OF LICENSING AND REGULATION, APRIL 7, 1964

A 47.7-CURIE COBALT-60 SOURCE BECAME UNCOUPLED AND JAMMED IN THE RADIOGRAPHY SOURCE TUBE 1 FOOT FROM THE STORAGE CONTAINER. AN ATTEMPT TO RECTIFY THE MALFUNCTION RESULTED IN ONE RADIOGRAPHER RECEIVING THIRD-DEGREE BURNS ON THREE FINGERS OF HIS LEFT HAND. FILM BADGE, WORN ON HIS BELT, READ 3.45 R. THE OTHER RADIOGRAPHER RECEIVED AN ESTIMATED DOSE TO THE HANDS OF 1000 RADS, AND 2.05 RADS WHOLE BODY.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, EQUIPMENT + SOURCE, RADIATION + *PERSONNEL EXPOSURE, RADIATION + *INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR

26353

RESPONSE TO AEC CITATION FOR DEFICIENCIES IN RADIOGRAPHY OPERATIONS.
PITTSBURGH TESTING LABORATORY, PITTSBURGH, PENNSYLVANIA
6 PAGES, LETTER TO E.R. PRICE, AEC DIVISION OF STATE AND LICENSEE RELATIONS FROM H.F. HEDDERICH, AUGUST 7, 1964

EXPLANATIONS GIVEN FOR EACH OF 8 VIOLATIONS AT THE ALABAMA BRANCH AND 5 VIOLATIONS AT THE PITTSBURGH BRANCH. ALABAMA BRANCH DENIES (1) NOT INSTRUCTING EMPLOYEES ON HAZARDOUS AND PRECAUTIONS TO MINIMIZE EXPOSURES, AND (2) USING AN UNAUTHORIZED CONTROL CABLE IN AN EXPOSURE DEVICE. PENNSYLVANIA BRANCH DENIES (1) FAILURE TO MAKE SURVEYS IN UNRESTRICTED AREAS AND (2) ALLOWING RADIATION LEVELS ON SURFACE OF STORAGE CONTAINER TO EXCEED LIMITS. THE CONTAINER WAS RECEIVED THE SAME DAY THE INSPECTOR ARRIVED. HOWEVER, ITS INADEQUACY HAD BEEN ANTICIPATED, AND SPECIAL CONTAINERS HAD BEEN CONSTRUCTED, WHICH WERE BEING PAINTED. THE CONTAINER IN QUESTION WAS SHOWN TO THE INSPECTOR TO VERIFY THEY HAD ANTICIPATED ITS INADEQUACY.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, OPERATOR ERROR + SOURCE, RADIATION + *PERSONNEL EXPOSURE, RADIATION + *STORAGE CONTAINER + *FAILURE, ADMINISTRATIVE CONTROL

26324

AEC CITATION FOR DEFICIENCIES IN RADIOGRAPHY OPERATIONS
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D. C.
2 PAGES, LETTER TO PITTSBURGH TESTING LABORATORY FROM E.R. PRICE, JULY 15, 1964

ALABAMA BRANCH CITED FOR THE FOLLOWING - (1) EMPLOYEES RECEIVED DOSES IN EXCESS OF LIMITS, (2) DID NOT NOTIFY AEC OF OVEREXPOSURES, (3) INADEQUATE SURVEYS, (4) EMPLOYEE ENGAGED IN RADIOGRAPHY NOT ADEQUATELY INSTRUCTED, (5) FILM BADGES NOT PROCESSED IMMEDIATELY WHEN DOSIMETERS WERE FULLY DISCHARGED, (6) EMPLOYEE PERFORMED RADIOGRAPHY AFTER DOSIMETER DISCHARGED BEYOND ITS RANGE, (7) USE OF AN UNAUTHORIZED CONTROL CABLE IN AN EXPOSURE DEVICE, (8) FAILURE OF EMPLOYEE TO SUBMIT

26324 *CONTINUED*

WEEKLY RECORD OF DOSIMETER READINGS. PA. BRANCH CITED FOR (1) ALLOWING RADIATION LEVELS TO EXCEED LIMITS FOR UNRESTRICTED AREAS, (2) NO CONTROL DEVICES FOR HIGH-RADIATION AREA IN THE X-RAY ROOM, AND (3) RADIATION LEVEL EXCEEDED LIMIT ON SURFACE OF SOURCE STORAGE CONTAINER.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

FAILURE, OPERATOR ERROR + SOURCE, RADIATION + TRAINING + *PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + *FAILURE, ADMINISTRATIVE CONTROL + MONITOR, AREA

26352

RADIOGRAPHY INCIDENT - CHANGING HANDS DURING SOURCE RETRIEVAL RESULTS IN EXPOSURE
PITTSBURGH TESTING LABORATORY, PITTSBURGH, PENNSYLVANIA

4 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM R.G. GALLAGHER, OCTOBER 21, 1964

RADIOGRAPHER RECEIVED BODY DOSE OF 3.1 R AND HAND DOSE OF 3.9. AT THREE AM, AFTER MAKING AN EXPOSURE, THE RADIOGRAPHER WAS CRANKING THE SOURCE BACK TOWARD THE STORAGE CONTAINER AND CHANGED HANDS DURING THE CRANKING, INVERTING THE SOURCE DRIVE MECHANISM. THE SOURCE WENT BACK DOWN THE TUBE BELOW A THICK CONCRETE FLOOR WHERE IT WAS SHIELDED FROM THE SURVEY METER. WHEN THE METER READING DROPPED BACK TO NORMAL, HE ASSUMED THAT THE SOURCE WAS BACK IN THE SAFE.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

SOURCE, RADIATION + *PERSONNEL EXPOSURE, RADIATION + *INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR

26351

RADIOGRAPHY INCIDENT - CARELESS ATTITUDE TOWARD RADIATION RESULTS IN TERMINATION
PITTSBURGH TESTING LABORATORY, PITTSBURGH, PENNSYLVANIA

2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM H.F. HEDDERICH, OCTOBER 24, 1964

THE RADIOLOGICAL SAFETY COORDINATOR DISCOVERED THAT A RADIOGRAPHER HAD EXCEEDED HIS QUARTERLY EXPOSURE LIMIT, ACCORDING TO A PHONE CALL FROM THE FILM-BAGGE PROCESSOR. RADIOGRAPHER COULD NOT EXPLAIN BUT ADMITTED THAT HIS DOSIMETER HAD GONE BEYOND RANGE ON ONE OCCASION. HE WAS TERMINATED BECAUSE OF CARELESS ATTITUDE TOWARD RADIATION SAFETY, FAILING TO RECORD THE FACT THAT HIS DOSIMETER HAD GONE BEYOND RANGE, FAILING TO REPORT THE OVEREXPOSURE, AND TARDINESS IN FORWARDING A STATEMENT CONCERNING THE EXPOSURE.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*ADMINISTRATIVE CONTROL + FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR

26377

RECOVERY OF UNCOUPLED SOURCE - PLAN MINIMIZED PERSONNEL EXPOSURE
PITTSBURGH TESTING LABORATORY, PITTSBURGH, PENNSYLVANIA

4 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM H.F. HEDDERICH, DECEMBER 8, 1964

ON NOV. 9, 1964, AT 3/30 AM, A RADIOGRAPHER NOTICED THAT THE CRANK HANDLE OF RADIOGRAPHY EXPOSURE DEVICE WAS WORKING TOO FREELY. AN INTERMEDIATE CONNECTION BETWEEN TWO LENGTHS OF SOURCE TUBE HAD WORKED LOOSE. THE SOURCE HAD RUN OUT OF THE TUBE AT THAT POINT, AND THE CONTROL CABLE HAD EXTENDED BEYOND THE GEAR WHEEL. THE PIGTAIL ALSO BECAME UNCOUPLED WHILE OUTSIDE THE SOURCE TUBE. THE SUPERVISOR, RADIOGRAPHER, AND RADIATION SAFETY OFFICER FORMULATED A PLAN. THE RSO, WHILE STANDING BEHIND STEEL COLUMN AND USING 8-FT HANDLING RODS, MANIPULATED SOURCE AND RETURNED IT TO THE EXPOSURE DEVICE. MAXIMUM EXPOSURE WAS 250 MR.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*SOURCE, RADIATION + PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + INCIDENT, NONREACTOR + *INCIDENT, RECOVERY FROM

26376

CITATION FOR DEFICIENCY IN RADIOGRAPHY OPERATIONS
PITTSBURGH TESTING LABORATORY, PITTSBURGH, PENNSYLVANIA

3 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSE RELATIONS FROM H.F. HEDDERICH, FEBRUARY 23, 1965

COMPANY RESPONSES TO CITATIONS RESULTING FROM INVESTIGATION DEC 7, 1964 WERE (1) FAILURE TO NOTIFY EMPLOYEES WITHIN 30 DAYS OF THE NATURE AND EXTENT OF EXPOSURE WAS BECAUSE WE COULD NOT HONESTLY EVALUATE THE EXTENT OF EXPOSURE IN THE ALLOTTED TIME, AND (2) FAILURE TO PERFORM SIX UNANNOUNCED INSPECTIONS IN THE THIRD QUARTER WAS OVERSIGHT BY FORMER EMPLOYEE, AND PERFORMANCE OF ALL SIX INSPECTIONS WITHIN TWO WEEKS WAS DUE TO CHANGE IN PERSONNEL AND NEED TO MEET REQUIREMENT.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*TRAINING + *FAILURE, ADMINISTRATIVE CONTROL

06918

LOST RADIATION SOURCES JUNE 7-15, 1965

06918 *CONTINUED*
PITTSBURGH TESTING LABORATORY

1 PAGE- JULY 13, 1965, ATOMIC ENERGY CLEARING HOUSE 11(32)- 25 (AUGUST 9, 1965)- PDR

ACCIDENTAL DROPPING OF THESE SOURCES INTO THE GULF OF MEXICO OCCURRED APPROXIMATELY 60 MILES SOUTH-SOUTHWEST OF MORGAN CITY, LOUISIANA. ON JUNE 7, OUR RADIOGRAPHER WAS OPERATING A UNIT CONTAINING APPROXIMATELY 20 CURIES OF IRIIDIUM 192. AFTER SOURCE TUBE WAS IN POSITION FOR EXPOSURE, THE RADIOGRAPHER UNLOCKED THE EXPOSURE DEVICE AND PROCEEDED TO UNROLL THE CONTROL CABLE. IN AN ATTEMPT TO GET THE CONTROL CABLE STRAIGHT, HE FLIPPED THE CABLE OVER BECAUSE IT WAS PARTIALLY COILED. WHEN HE FLIPPED THE CONTROL CABLE OVER, THE SWIVEL COUPLING THAT THREADS INTO THE LOCK BOX AND SECURES THE CONTROL CABLE BECAME UNCOUPLED CAUSING THE SOURCE PIGTAIL TO PULL OUT OF THE REAR OF THE UNIT IN A HORIZONTAL POSITION AND FALL SIDEWAYS. IT DISCONNECTED ITSELF FROM THE DRIVE CABLE CONNECTOR ASSEMBLY, AND FELL THROUGH THE PLATFORM GRATING INTO THE GULF OF MEXICO AND IN APPROXIMATELY 138 FEET OF WATER. WHILE WORKING AT THE SAME JOB LOCATION, A SURVEY METER CONTAINING 8.8 MICROCURIES OF STRONTIUM 90 WAS ACCIDENTALLY KNOCKED OFF A TEMPORARY PLATFORM CONSISTING OF TWO PLANKS AND FELL INTO THE GULF OF MEXICO. OUR INVESTIGATION MAKES US REASONABLY CERTAIN THAT IT WOULD BE ALMOST IMPOSSIBLE TO RETRIEVE THE SOURCES SINCE THE AREA IS SUBJECTED TO CONSIDERABLE CURRENTS AND HEAVY WAVE ACTION AND THE BOTTOM IS HEAVY SILT AND SEDIMENTARY DEPOSITS. THE SOURCE WILL BE DECAYED TO LESS THAN ONE CURIE AFTER THE LAPSE OF ONE YEAR. WE HAVE NOTIFIED PEOPLE SO ARRANGEMENTS CAN BE MADE FOR PERSONNEL MONITORING DEVICES IF A DIVER MUST GO DOWN FOR ANY REPAIRS OR INSPECTION WORK.

SOURCE, RADIATION + WASTE DISPOSAL, OCEAN + RADIATION SAFETY AND CONTROL + *SOURCE, RADIATION, LOST

26339
RADIOGRAPHY SOURCE LOST FOR TWO DAYS
PITTSBURGH TESTING LAB, PITTSBURGH, PENNSYLVANIA

6 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM H. F. HEDDERICH, SEPTEMBER 2, 1966

ON JULY 26, 1966, A 14-CURIE IR-192 SOURCE WAS LOST FROM AN EXPOSURE DEVICE. WHILE BEING CARRIED FROM ONE AREA TO ANOTHER THE LOCK SNAPPED OPEN AND THE SOURCE FELL OUT. ON JULY 28, THE SOURCE WAS FOUND NEAR THE WALK AREA. THE MAXIMUM EXPOSURE FOR THE INCIDENT AND RECOVERY WAS 76 MILLIREMS.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

INCIDENT, NONREACTOR + *SOURCE, RADIATION, LOST

09295
COMPANY NOTIFIES INDIVIDUAL OF 7.5 MILLIREM WHOLE BODY EXPOSURE (IR-192)
PITTSBURGH TESTING LABORATORY, PA

23 PAGES, LETTER - PITTSBURGH TESTING LABORATORY TO STRUCTURAL STEEL WORKER - MARCH 11, 1968

WELDER ACCIDENTALLY WALKED INTO RADIATION AREA (RADIOGRAPHY). BASED ON CALCULATIONS FROM A 25-CURIE IRIIDIUM-192 SOURCE FOR TEN SECONDS AT EACH POSITION AND EXCLUDING THE STEEL COLUMNS AS A SHIELD, WE ESTIMATE THAT YOUR BODY RECEIVED APPROXIMATELY 7.5 MILLIREMS, WHICH, BY ALL MEANS IS NOT HARMFUL AND IF ALL FACTS ARE TRUE YOU WILL NOT HAVE ANY COMPLICATIONS FROM THIS EXPOSURE. AS A MATTER OF INFORMATION, RADIOGRAPHIC PERSONNEL WHO PERFORM THESE OPERATIONS, RECEIVED AN AVERAGE OF 10 MILLIREMS PER DAY.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + *FAILURE, OPERATOR ERROR

09193
WORKER TRESPASSES ONTO RESTRICTED AREA (RADIOGRAPHY) AND MAY HAVE RECEIVED 172-MILLIREM EXPOSURE
PITTSBURGH TESTING LABORATORY, PA

2 PAGES, LETTER - PITTSBURGH TESTING LABORATORY TO DIVISION OF COMPLIANCE (AEC) - APRIL 29, 1968

THE RADIOGRAPHER HAD HAD TO WARN OTHER PEOPLE THAT EVENING WHO WERE JUMPING THE ROPES OF THE RESTRICTED AREA. HOWEVER, THOSE INDIVIDUALS DID NOT GET NEAR THE SOURCE, BUT WERE ESCORTED OUT OF THE AREA AS SOON AS THEY MANAGED TO GET OVER THE ROPES. ALL PERSONNEL WORKING THAT EVENING WERE SENT TO THE DOCTOR FOR BLOOD TESTS AND WERE PUT ON NOTICE THAT THEY WOULD BE SUBJECT TO DISMISSAL SHOULD THEY CROSS OUR BARRICADES IN THE FUTURE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + *FAILURE, OPERATOR ERROR

64098
NOTIFIES DIV. OF COMPLIANCE THAT RADIOGRAPHER RECEIVED SLIGHTLY EXCESSIVE DOSE FOR QUARTER
PITTSBURGH TESTING LABORATORY

3 PAGES, LETTER - PITTSBURGH TESTING LABORATORY TO DIVISION OF COMPLIANCE (AEC) - AUGUST 15, 1968

DURING THE SECOND CALENDAR QUARTER THIS YEAR, ONE OF OUR EMPLOYEES RECEIVED A RADIATION DOSE BEYOND HIS LIMITS. THE INDIVIDUAL WAS PERMITTED A DOSE OF 3000 MILLIREMS. HOWEVER, FILM-BADGE RESULTS SHOW THAT HE RECEIVED A TOTAL OF 3026. THE EXPOSURE WAS DISTRIBUTED FOR THE THREE MONTH

64098 *CONTINUED*

PERIOD, THEREFORE, TO THE BEST OF OUR KNOWLEDGE, NOTHING UNUSUAL OCCURRED. DURING THIS PERIOD, THIS INDIVIDUAL WAS ASSIGNED TO A HIGH PRODUCTION JOB WITH MANY INDIVIDUAL SHOTS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION

27898

CITATION FOR RADIOGRAPHY NONCOMPLIANCE
PITTSBURGH TESTING LABORATORY, PITTSBURGH, PA.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE, 14(34), PAGE 18, (AUGUST 19, 1968)

(COMPLIANCE LETTER, JUNE 6) A FEB. 68 INSPECTION REVEALED ITEMS OF NONCOMPLIANCE - (1) DIRECT SURVEILLANCE WAS NOT DONE TO PROTECT AGAINST UNAUTHORIZED ENTRY TO AN EXPOSED 25-CURIE IR-192 SOURCE AT JOHN HANCOCK BLDG., CHICAGO. (2) HIGH RADIATION AREA WAS NOT POSTED. (3) SAFETY PLUG WAS NOT INSERTED AFTER USAGE. (4) RECORDS OF SURVEYS WERE NOT MAINTAINED. (PTL REPLY, JULY 18) WE HOPE THESE ITEMS WILL NOT HAPPEN AGAIN. OUR RAD SAFETY COORDINATOR HAS SENT A LETTER TO ALL RADIOGRAPHERS.

*FAILURE, OPERATOR ERROR

41646

HIGH RADIATION FIELD DEVELOPED IN SHIPMENT OF RADIOGRAPHIC EXPOSURE DEVICE FROM IMPROPER PACKAGING
PITTSBURGH TESTING LABORATORY, PA.
30 PAGES, FIGURES, LETTER TO DIVISION OF COMPLIANCE FROM PITTSBURGH TESTING LABORATORY, MARCH 14, 1969

THE DEVICE WAS EMANATING A RADIATION FIELD OF 20 R/HR WHEN IT ARRIVED AT DESTINATION. WHEN THE SHIPPING BOX WAS OPENED, THE SOURCE WAS VISIBLE OUTSIDE THE SHIELD BECAUSE SPECIAL LOCK DEVICES FOR USE DURING HANDLING HAD NOT BEEN PROPERLY INSTALLED. AN INVESTIGATION COULD NOT DETERMINE WHERE BETWEEN POINT OF PACKAGING AT SALT LAKE CITY AND PITTSBURGH THE SOURCE LEFT THE SHIELD OR HOW MANY PEOPLE WERE ACTUALLY EXPOSED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, OPERATOR ERROR + PROCEDURES AND MANUALS + *SOURCE, RADIATION + SURVEY, RADIATION + *PERSONNEL EXPOSURE, RADIATION

41533

RADIOGRAPHER RECEIVES FILM BADGE EXPOSURE OF 9.1 REM
PITTSBURGH TESTING LABORATORY
3 PAGES, LETTER - PITTSBURGH TESTING LABORATORY TO AEC DIVISION OF COMPLIANCE - JUNE 16, 1969

ON APRIL 23, 1969, FILM-BADGE REPORT INDICATED RADIOGRAPHER WORKING AT DRESDEN POWER STATION RECEIVED 9.1-REM EXPOSURE. RADIOGRAPHER WAS SHOCKED UPON NOTIFICATION AND COULD NOT EXPLAIN CAUSE. NO EXPLANATION WAS FOUND, SO THE DOSE WAS ADDED TO HIS EXPOSURE RECORD.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*INCIDENT, EXPOSURE + *PERSONNEL EXPOSURE, RADIATION

41532

REPORT OF STOLEN 32 CURIE SOURCE
PITTSBURGH TESTING LABORATORY
4 PAGES, LETTER - PITTSBURGH TESTING LAB TO AEC DIVISION OF COMPLIANCE - NOVEMBER 15, 1969

ON OCT. 25, 1969, FOUR YOUNG BOYS (AGES 9 TO 14) STOLE A COMPANY TRUCK CONTAINING A 32-CURIE TR-192 SOURCE. THE TRUCK WAS RETURNED BY THE BOYS BUT THE RADIOGRAPHY DEVICE CONTAINING THE SOURCE WAS LOST. THE SOURCE AND DEVICE WERE LATER FOUND ALONG THE SIDE OF A ROAD IN AN UNPOPULATED AREA. NO RADIATION EXPOSURES TO PERSONNEL OCCURRED. THE THEFT COULD HAVE BEEN AVOIDED IF THE SOURCE HAD BEEN PLACED IN ITS PROPER STORAGE AREA WITHIN THE LABORATORY.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*INCIDENT, HUMAN ERROR + *SOURCE, RADIATION, LOST + OPERATING EXPERIENCE

41528

OVEREXPOSURE TO RADIOGRAPHERS ASSISTANT
PITTSBURGH TESTING LAB
1 PAGE, LETTER - PITTSBURGH TESTING LAB TO AEC DIVISION OF COMPLIANCE - NOVEMBER 20, 1969

ON SEPT. 13, 1969, ONE-HANDED DARKROOM ATTENDANT ASSISTING A RADIOGRAPHER RECEIVED A WHOLE BODY EXPOSURE OF 19.6 REM AND AN EXPOSURE TO THE HAND OF 45 TO 543 REM. THE RADIOGRAPHIC EQUIPMENT WAS BEING PERFORMED FROM A SCAFFOLDING 54 INCHES ABOVE GROUND LEVEL. THE CONTROL CABLES WERE DRAPED OVER THE END OF THE SCAFFOLDING. WHEN FILM WAS IN PLACE FOR EXPOSURE, ATTENDANT UNLOCKED THE DEVICE AT WHICH TIME THE CABLES PULLED THE SOURCE PIGTAIL OUT OF THE LOCK BOX ONTO

41528 *CONTINUED*

SCAFFOLDING. THE ATTENDANT GRASPED AND EXAMINED THE PIGTAIL. WHEN HE REALIZED WHAT IT WAS HE DROPPED IT AND RAN. CAUSE OF INCIDENT ATTRIBUTED TO THE INDIVIDUAL NOT BEING FAMILIAR WITH EQUIPMENT AND A WORN SWIVEL ADAPTER.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*INCIDENT, EXPOSURE + FAILURE, OPERATOR ERROR + PERSONNEL EXPOSURE, RADIATION + *INCIDENT, HUMAN ERROR + *OPERATING EXPERIENCE

41529

NONCOMPLIANCE IN RADIOGRAPHY OPERATIONS

AEC, DIVISION OF COMPLIANCE

2 PAGES, LETTER - AEC DIVISION OF COMPLIANCE TO PITTSBURGH TESTING LAB - JANUARY 12, 1970

INVESTIGATION IN SEPTEMBER 1969 OF PERSONNEL EXPOSURES DURING RADIOGRAPHIC OPERATIONS REVEALED NONCOMPLIANCE WITH AEC STANDARDS FOR (1) PERMITTING INDIVIDUAL TO PERFORM RADIOGRAPHY WITHOUT DEMONSTRATING COMPETENCE AND (2) FAILURE TO NOTIFY AEC IMMEDIATELY FOLLOWING INCIDENT WHEREIN IT APPEARED ONE PERSON MAY HAVE RECEIVED A WHOLE-BODY DOSE IN EXCESS OF 25 REMS AND 375 REMS TO THE HANDS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

INCIDENT, EXPOSURE + PERSONNEL EXPOSURE, RADIATION + *FAILURE, ADMINISTRATIVE CONTROL + *RADIATION SAFETY AND CONTROL

40968

RADIOGRAPHER ASSISTANT RECEIVE SEVERE EXPOSURE FROM 28 CURIE IRIIDIUM 192 SOURCE

PITTSBURGH TESTING LABORATORY, PA.

1 PAGE, ATOMIC ENERGY CLEARING HOUSE, 16(4), PAGE 36 (JANUARY 26, 1970)

PITTSBURGH TESTING LABORATORY EMPLOYEE RECEIVES 20 REM EXPOSURE AT ROBINSON ILL., SITE WAS A DARKROOM. ATTENDANT UNFAMILIAR WITH THE HANDLING OF SOURCES USED IN RADIOGRAPHY. BECAUSE OF A WORN PART OF THE SHIELDING CONTAINER, THE SOURCE WAS COMPLETELY REMOVED FROM SHIELD, AND THE INDIVIDUAL RECEIVED NEARLY 20 REMS WHOLE-BODY EXPOSURE AND A LEFT-HAND EXPOSURE UP TO 543 REMS ON SEPT. 13, 1969. INDIVIDUAL WAS HOSPITALIZED FOR BCNE-MARROW ANALYSIS AND OBSERVATION. NO INDICATION OF RADIATION BURN TO LEFT HAND AS OF OCTOBER 7, 1969.

*INCIDENT, EXPOSURE + FAILURE, EQUIPMENT + FAILURE, OPERATOR ERROR + *SOURCE, RADIATION + *TRAINING + PERSONNEL EXPOSURE, RADIATION + *IRIDIUM + FAILURE, ADMINISTRATIVE CONTROL

44909

PITTSBURGH TESTING LABORATORY LOSES A 32 MICROCURIE STRONTIUM-90 SOURCE

PITTSBURGH TESTING LABORATORY

2 PAGES, LETTER - PITTSBURGH TESTING LABORATORY TO DIVISION OF COMPLIANCE (AEC) - MARCH 11, 1970

THE SOURCE WHICH WAS CONTAINED IN A VICTOREEN MODEL AGB-500B-SR INSTRUMENT WAS LOST SOMETIME BETWEEN NOVEMBER 19, 1969 AND FEBRUARY 11, 1970. INSTRUMENT WAS PROPERLY LABELED. THIS LOSS DOES NOT CONSTITUTE ANY EXTREME DANGER OF RADIATION EXPOSURE UNLESS TAKEN INTERNALLY.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*INSTRUMENT, RADIATION MONITORING + *STRONTIUM + INCIDENT, HUMAN ERROR + *SOURCE, RADIATION, LOST

48244

WORKER EXCEEDS QUARTERLY LIMIT OF GAMMA RADIATION EXPOSURE

PITTSBURGH TESTING LABORATORY, PITTSBURGH, PA.

4 PAGES, LETTER - PITTSBURGH TESTING LABORATORY TO DIVISION OF COMPLIANCE (AEC) - MAY 12, 1970

RESULTS OF FILM-BADGE REPORTS SHOW THAT THE INDIVIDUAL EXCEEDED HIS PERMISSIBLE DOSE IN THE FIRST CALENDAR QUARTER, 1970 BY 398 MILLIREMS. THE INDIVIDUAL WAS PERMITTED A QUARTERLY DOSE OF 3,000 MILLIREMS. HOWEVER, FILM BADGE REPORTS SHOW THAT HE RECEIVED 3,398 MILLIREMS. THE HIGH EXPOSURE IN MARCH 1970 (1960 MILLIREMS) WAS UNEXPECTED DUE TO THE FACT THAT THE INDIVIDUAL HAD A TWO (2) MONTH TOTAL OF 1438 MILLIREMS AT THE END OF FEBRUARY, 1970. BADGE RESULTS FOR MARCH SHOW A TOTAL OF 1960 MILLIREMS, HOWEVER, TO THE BEST OF OUR KNOWLEDGE AND THROUGH TELEPHONE CONVERSATIONS WITH THE INDIVIDUAL, NOTHING UNUSUAL OCCURRED THAT PARTICULAR MONTH.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + MONITOR, PERSONNEL

56046

EMPLOYEE EXCEEDS PERMISSIBLE QUARTERLY GAMMA EXPOSURE

PITTSBURGH TESTING LABORATORY

3 PAGES, LETTER - PITTSBURGH TESTING LABORATORY TO DIVISION OF COMPLIANCE (AEC) - AUGUST 11, 1970

56046 *CONTINUED*

RADIOGRAPHER RECEIVED 3.36-REM QUARTERLY DOSE. DOSIMETER INDICATED MUCH LESS. A SECOND DOSIMETER WAS GIVEN TO IMPROVE AGREEMENT. EMPLOYEE WAS REQUESTED TO LEAVE RADIOGRAPHIC DEVICE FASTER TO MINIMIZE EXPOSURE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + FAILURE, OPERATOR ERROR + SOURCE, RADIATION

59935

PITTSBURGH TESTING LABORATORY RECEIVED CONTAINER WITH OUTSIDE SURFACE CONTAMINATION
PITTSBURGH TESTING LABORATORY, PENNSYLVANIA

1 PAGE, TWX - PITTSBURGH TESTING LABORATORY TO U.S. ATOMIC ENERGY COMMISSION - OCTOBER 20, 1970

DOSE RATE ON OUTSIDE OF SHIPPING CONTAINER WAS 300 MR/HR WHEN RECEIVED. PACKAGE CONTAINED A 52.2-CI IRIIDIUM-192 SOURCE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*SOURCE, RADIATION + LEAK + *SURFACE CONTAMINATION + *SHIPPING CONTAINER + IRIIDIUM + CONTAMINATION + FAILURE, EQUIPMENT

63683

RADIOGRAPHER RECEIVES SLIGHT OVEREXPOSURE
PITTSBURGH TESTING LABORATORY

5 PAGES, LETTER TO DIVISION OF COMPLIANCE FROM PITTSBURGH TESTING LABORATORY, PA 15220, DECEMBER 9, 1970

THE COMPANY HAS BEEN WATCHING THIS INDIVIDUAL VERY CAREFULLY DUE TO THE RADIATION EXPOSURE HE RECEIVED THE PAST CALENDAR QUARTER. HOWEVER, THE FILM-BADGE RESULTS FOR SEPTEMBER WERE MUCH MORE THAN ANTICIPATED. ABOUT 800 MILLIREMS WERE ANTICIPATED, BUT THE BADGE RESULTS INDICATED AN EXPOSURE OF 1,540. THEREFORE, THIS AMOUNT OF RADIATION ADDED TO HIS TWO PREVIOUS MONTHLY TOTAL OF 1,540 MILLIREMS PERMITTED THIS INDIVIDUAL TO EXCEED HIS QUARTERLY PERMISSIBLE DOSE OF 3,000 MILLIREMS BY 100. AN ASSISTANT RADIOGRAPHER WAS ASSIGNED TO THIS JOB IN ORDER TO SHARE THE RADIATION EXPOSURE DUE TO THIS HIGH-PRODUCTIVITY JOB SCHEDULE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + *SOURCE, RADIATION

65439

PITTSBURGH TESTING LABORATORY REPORT 2 EXPOSURE INCIDENTS
PITTSBURGH TESTING LABORATORY, PITTSBURGH, PENNSYLVANIA

20 PAGES, LETTER FROM PITTSBURGH TESTING LABORATORY TO DIVISION OF COMPLIANCE, APRIL 26, 1971

ON FEB. 26, 1971, A RADIATION AREA WAS LEFT UNATTENDED FOR ABOUT 45 MIN AT BETHLEHEM STEEL CORP. TWO PEOPLE ENTERED AREA DURING THIS TIME. EXPOSURE ESTIMATED TO BE ABOUT 36 MR. RADIOGRAPHER LEFT AREA TO REPAIR HIS CAR. HE QUIT JOB BEFORE THE INVESTIGATION. *** TWO WORKERS ENTERED A RESTRICTED AREA WHILE A SHOT WAS BEING MADE DURING LUNCH. 1 OF THE 2 HAD HELPED SET UP SHOT BUT FORGOT THE SOURCE WAS OUT. EXPOSURES ON FILM BADGES WERE 350 AND 330 MR.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + *FAILURE, OPERATOR ERROR + SOURCE, RADIATION

64378

AUGUST INSPECTION REVEALS NONCOMPLIANCE WITH BYPRODUCT MATERIAL LICENSE
U. S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE

2 PAGES, LETTER - DIVISION OF COMPLIANCE TO PNEUMAT-A-RAY PRODUCTS, INC. - SEPTEMBER 22, 1971

AEC REQUESTS - YOU BRING ALL RECORDS REQUIRED BY 10 CFR PARTS 20, 30, AND 34 AND YOUR AEC LICENSE, WHICH PERTAIN TO ACTIVITIES PERFORMED BY PNEUMAT-A-RAY PRODUCTS, INC. SINCE DECEMBER 1, 1970. WE ARE PARTICULARLY INTERESTED IN RECORDS AS DESCRIBED IN THE ENCLOSURE TO THIS LETTER. TELEPHONE MR. GEN ROY OF MY STAFF (301-973-7347) AT YOUR EARLIEST CONVENIENCE TO ARRANGE FOR SCHEDULING THE MEETING. WE ARE SENDING A SEPARATE LETTER TO BAKERSFIELD X-RAY SERVICES, INC., REQUESTING THEIR ATTENDANCE AT THIS MEETING.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*FAILURE, ADMINISTRATIVE CONTROL

63796

REPORT OF A LEAKING SOURCE

63796 *CONTINUED*

U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.
LETTER FROM DIVISION OF COMPLIANCE TO PORTSMOUTH NAVAL SHIPYARD +. 2 PAGES, MARCH 30, 1971

EARLIER CHECKS OF THE SOURCE TUBE INDICATED LEAKAGE, THEN TESTS IN AUG. 1969 INDICATED THAT THE TUBE WAS NOT LEAKING AND WAS PROBABLY CONTAMINATED DURING MANUFACTURE. ON MARCH 30, 1971, THE SOURCE CYLINDER INDICATED 0.016 MILLICURIE OF ACTIVITY AND LEAKING TUBE. THE CHAMBER WAS PACKAGED FOR DISPOSAL.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*CESIUM + FAILURE, EQUIPMENT + *SOURCE, RADIATION + *LEAK

65441

WORKER RECEIVED OVEREXPOSURE AT POWER PIPING COMPANY
POWER PIPING COMPANY, PITTSBURGH, PENNSYLVANIA
3 PAGES, LETTER FROM POWER PIPING COMPANY TO DIVISION OF COMPLIANCE, APRIL 5, 1971

A RADIOGRAPHER RECEIVED AN EXPOSURE OF ABOUT 1440 MR ON JAN. 7, 1970, FROM AN IR-192 SOURCE. THE DRIVE CABLE WAS DAMAGED. EXPOSURE OCCURRED WHILE DISCONNECTING THE CABLE AND RETRIEVING SOURCE INTO ITS SHIELD.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + IRIIDIUM + *FAILURE, EQUIPMENT + *CABLES AND CONNECTORS + SOURCE, RADIATION

06917

JUPPENLATS JW
RADIATION EXPOSURE AT QUAKER ALLOY CASTING CO., FEBRUARY 23, 1965
QUAKER ALLOY CASTING CO., MYERSTOWN, PENNSYLVANIA
1 PAGE- MARCH 19, 1965, ATOMIC ENERGY CLEARING HOUSE 11(31)- 41 (AUGUST 2, 1965)- PDR

THE ACCIDENT OCCURRED AS THE SHIFTS WERE CHANGING. OPERATOR A WAS EXPLAINING PROGRESS ON RADIOGRAPHIC EXAMINATION OF A CASTING FOR OPERATOR B WHO WAS TO CONTINUE THE EXAMINATION. OPERATOR A HAD PREMATURELY WITHDRAWN THE KEY FOR OPERATION OF THE UNIT AND THE SOURCE HAD NOT RETURNED TO THE COMPLETE OFF POSITION. A SPRING HAD FAILED TO RETURN THE SOURCE TO A SAFE POSITION, OPERATOR A FURTHER FAILED TO OBSERVE OPERATING INSTRUCTIONS PROPERLY AND IMPROPERLY READ THE SURVEY METERS. OPERATOR A RECEIVED A DOSAGE OF 4750 MR AND OPERATOR B A DOSAGE OF 10,000 MR. MEDICAL REPORTS INDICATE NO PERMANENT IMPAIRMENT TO EITHER OPERATOR. SINCE A PARTIAL CAUSE OF THE ACCIDENT WAS A MECHANICAL FAILURE, THE COMPANY TOOK IMMEDIATE STEPS TO PREVENT ITS POSSIBLE RECURRENCE BY INSTALLING SCLENOID LOCKS WHICH PREVENT REMOVAL OF THE OPERATING KEY UNTIL THE SOURCE HAS FIRST BEEN RETURNED TO THE SHIELDED POSITION.

SOURCE, RADIATION + *INCIDENT, EQUIPMENT + RADIATION SAFETY AND CONTROL + *INCIDENT, NONREACTOR

16658

RADIOGRAPHY INCIDENT AT QUAKER ALLOY CASTING. MAY 17, 1967
QUAKER ALLOY CASTING CO., MYERSTOWN, PA.
1 PAGE, ATOMIC ENERGY CLEARING HOUSE 13(29), PAGE 27 (JULY 17, 1967)

(JUNE 12) A RADIOGRAPHER ENTERED THE EXPOSURE CELL UNAWARE THAT THE 450-CURIE CO-60 SOURCE HAD SEPARATED FROM THE CABLE. HIS SURVEY METER HAD A DEAD BATTERY, BUT HE HAD CHECKED HIS DOSIMETER, WHICH HE FOUND TO BE OFF SCALE. FILM-BADGE MEASURED 10 REMS. CORRECTIVE ACTION - (1) ONLY FRESH BATTERIES WILL BE USED, RECHARGING WILL BE DISCONTINUED, (2) A SEQUENCE COUNTER WILL RECORD THE CYCLE OF OPERATION, (3) RADIATION DETECTORS AND LIGHTS ORIGINALLY SUPPLIED WILL BE REMOVED, (4) EXPOSURE CELL-DOORS WILL BE INTERLOCKED SO AN ALARM SOUNDS IF DOOR IS OPENED WITH SOURCE EXPOSED.

*FAILURE, OPERATOR ERROR + MONITOR, PERSONNEL + INSTRUMENT, INTERLOCK + FAILURE, INSTRUMENT + *PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL

47158

RADIOGRAPHER RECEIVES OVEREXPOSURE (3.8 R TO HANDS AND ARMS, IR-192)
QUAKER ALLOY CASTING COMPANY
9 PAGES, LETTER - QUAKER ALLOY CASTING COMPANY TO DIVISION OF COMPLIANCE (AEC) - MAY 28, 1969

THE FACT THAT PROPER USE OF HIS SURVEY METER WOULD HAVE PREVENTED THIS EXPOSURE HAS BEEN EMPHASIZED TO THIS RADIOGRAPHER AS WELL AS THE OTHER MEMBERS OF THE DEPARTMENT. SOURCE CONTROLS FOR THE PORTABLE, CRANK-TYPE SOURCES WILL BE IDENTIFIED WITH THE APPROPRIATE EXPOSURE CELL. A WRITTEN NOTICE WILL BE POSTED WHEN AUXILIARY WARNING EQUIPMENT IS INOPERATIVE. THIS NOTICE WILL BE POSTED ON THE EXPOSURE ROOM DOOR AND AT THE SHIFT SUPERVISORS DESK.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + *FAILURE, OPERATOR ERROR + IRIIDIUM

42008
 RADIOGRAPHER RECEIVES EXPOSURE FROM FAULTY EQUIPMENT AND PERSONAL NEGLIGENCE
 QUAKER ALLOY CASTING COMPANY, MYERSTOWN, PENNSYLVANIA
 9 PAGES, LETTER TO DIVISION OF COMPLIANCE (AEC) FROM QUAKER ALLOY CASTING CO., JANUARY 5, 1970

HE WAS PERFORMING RADIOGRAPHY WITH A 28-CURIE IRIIDIUM SOURCE IN A SHIELDED CELL. UPON COMPLETION OF EXPOSURE HE RETRACTED THE SOURCE AND UNPLUGGED THE AUXILIARY ALARM SYSTEM BEFORE ENTERING THE CELL. HE CARRIED A SURVEY METER INTO THE CELL BUT FAILED TO OBSERVE IT. HE MADE TWO ENTRIES INTO THE CELL TO REMOVE FILM AND THE CASTING FOR AN ESTIMATED 3 MINUTES IN CELL. THE DAY-SHIFT RADIOGRAPHER DISCOVERED THE SOURCE IN EXPOSED POSITION WHEN HE SURVEYED CELL. SOURCE HAD FAULTY RETRACTING MECHANISM. NIGHT-SHIFT RADIOGRAPHER RECEIVED 640 MR.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

FAILURE, EQUIPMENT + *FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION

57463
 EXPOSURE OF EMPLOYEE AT QC LABORATORIES
 QC LABORATORIES, INC. OHIO
 1 PAGES, LETTER - QC LABORATORIES, INC. TO DIVISION OF REACTOR LICENSING (AEC) - OCTOBER 5, 1970

THE RETRACTION-CABLE MECHANISM OF AN ISOTOPE CAMERA CONTAINING 95 CURIES OF IR-192 FAILED TO RETURN THE SOURCE CAPSULE TO THE CONTAINER. WHILE WORKING ON THE UNIT TO SECURE THE CAPSULE THE OPERATOR RECEIVED AN EXPOSURE OF 3250 MR IN 8 MIN. ON A FILM BADGE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + *FAILURE, EQUIPMENT + SOURCE, RADIATION + MAINTENANCE AND REPAIR

26314
 CITATION FOR NONCOMPLIANCE TO RADIOGRAPHY REGULATIONS
 UNITED STATES ATOMIC ENERGY COMMISSION
 3 PAGES, LETTER TO RADIOLOGICAL TESTING LAB FROM L.D. LOW, MARCH 6, 1968

AEC CITED COMPANY FOR FAILING TO (1) SURVEY UNRESTRICTED AREAS, (2) MAINTAIN RECORDS OF SURVEYS, (3) POST RADIATION AREAS, (4) PERFORM ADEQUATE SURVEYS AFTER EXPOSURES, (5) DIRECTLY SURVEY TO PROTECT AGAINST UNAUTHORIZED ENTRY DURING OPERATIONS, (6) PREVENT UNAUTHORIZED PERSONNEL FROM PERFORMING RADIOGRAPHY, AND (7) POST THE VEHICLE USED FOR TRANSPORTING SOURCE AND EXPOSURE DEVICE. AEC STATED THAT IMPROVEMENTS WERE NEEDED IN MANAGEMENT.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

SOURCE, RADIATION + *FAILURE, ADMINISTRATIVE CONTROL

25632
 CITATION OF RADIOLOGICAL TESTING LAB.
 RADIOLOGICAL TESTING LAB., MADISON, WISCONSIN + AEC DIVISION OF COMPLIANCE
 2 PAGES, ATOMIC ENERGY CLEARING HOUSE, 14(22), PAGE 21 AND 22, (MAY 27, 1968)

(CITATION, MARCH 6) A DEC. 1967 INSPECTION REVEALED SEVEN ITEMS OF NON-COMPLIANCE (NO SURVEYS NOR RECORDS OF SURVEYS DONE, IMPROPER POSTING, SURVEILLANCE, AND TRANSPORTATION). NUMBER AND NATURE INDICATE INADEQUATE MANAGEMENT CONTROL. (REPLY, MAR. 22). LISTS ACTIONS TAKEN FOR EACH SPECIFIC ITEM AND ASSERTS THE SAFETY OFFICE MAKES FREQUENT ON-SITE INSPECTIONS.

FAILURE, OPERATOR ERROR + *FAILURE, ADMINISTRATIVE CONTROL

09296
 SAFETY OFFICER REPLIES TO DIV. OF COMPLIANCE (RADIOGRAPHIC WORK)
 RADIOLOGICAL TESTING LABORATORIES, INC., WISCONSIN
 1 PAGE, LETTER - RADIOLOGICAL TESTING LABORATORIES, WIS. TO DIVISION OF COMPLIANCE (AEC) - JUNE 19, 1968

CONCERNING THE CORRECTIVE ACTION WE HAVE TAKEN TO ENSURE THAT SURVEYS WILL BE MADE AT THE RADIOGRAPHIC FIELD SITE TO EVALUATE THE LEVELS OF RADIATION EXISTING IN UNRESTRICTED AREAS DURING THE PERFORMANCE OF BY-PRODUCT MATERIAL RADIOGRAPHY, THE FOLLOWING STEPS ARE BEING TAKEN AND HAVE BEEN TAKEN SINCE YOUR LETTER OF APRIL 8, 1968. OUR SURVEY AND PRODUCTION RECORDS, A COPY OF WHICH WAS SENT TO YOU, MAKES IT MANDATORY FOR THE RADIOGRAPHER TO SKETCH IN THE MAXIMUM RADIATION LEVELS AT PERIMETER OF RESTRICTED AREA. NO RADIOGRAPHY MAY BE STARTED UNTIL THIS RESTRICTED AREA HAS BEEN ROPED OFF. AS SAFETY OFFICER I MAKE UNANNOUNCED VISITS TO THE RADIOGRAPHIC SITE TO SEE THAT WE ARE IN FULL COMPLIANCE WITH THE REQUIREMENT OF CFR 20.201, WHICH REQUIRES THAT THESE SURVEYS BE MADE. THE FREQUENCY OF MY VISITS HAVE BEEN AS HIGH AS 70 TO 80 PERCENT ON ALL FIELD JOBS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

11789
RICHARDSON X RAY SERVICE CITED FOR NONCOMPLIANCE
RICHARDSON X RAY SERVICE, ALHAMBRA, CALIFORNIA
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 12(40), PAGES 19-20 (OCTOBER 4, 1966)

A COMPLIANCE INSPECTION ON APRIL 14-16, 1966, INDICATED POOR WORKING HABITS ASSOCIATED WITH A 28-CURIE IR-192 SOURCE AT BOUNDARY DAM, WASHINGTON. RADIATION AREAS WERE NOT POSTED, SURVEYS WERE NOT MADE TO DETERMINE THAT THE SOURCE WAS SHIELDED, EXPOSURE METERS WERE NOT WORN, ETC. VARIOUS JOB REASSIGNMENTS AND SPECIAL TRAINING FOLLOWED.

*INCIDENT, HUMAN ERROR + *FAILURE, ADMINISTRATIVE CONTROL

16659
RICHARDSON X-RAY, ALHAMBRA, CITED FOR NCN-COMPLIANCE
RICHARDSON X-RAY SERVICE, ALHAMBRA, CALIFORNIA
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(29), PAGES 27-28 (JULY 17, 1967)

(MAY 17) A FEBRUARY AND A MARCH 13TH INSPECTION REVEALED 9 ITEMS OF NONCOMPLIANCE. A WELDERS HELPER WAS ALLOWED TO PLACE FILM ON PIPE AND THEN REMAIN NEAR THE 11-CURIE IR-192 SOURCE DURING EXPOSURE

*PERSONNEL EXPOSURE, RADIATION + *FAILURE, ADMINISTRATIVE CONTROL

17122
RICHARDSON X-RAY REPLIES TO COMPLIANCE CITATION OF MAY 17, 1967
RICHARDSON X-RAY SERVICE, ALHAMBRA, CALIFORNIA
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(33), PAGE 27 AND 28 (AUGUST 14, 1967)

(LETTER, JUNE 16) (ITEMS 1, 2, 6, AND 7) RADIOGRAPHER WAS INVOLVED IN EARLIER VIOLATION (METALINE FALLS, WASHINGTON, 1966), RETRAINED, AND STILL DISREGARDED OUR INSTRUCTIONS. HE WILL NOT BE USED AGAIN. (3, 4, 7) WE DISCONTINUED USE OF THE 5-IN. STORAGE CONTAINERS. THE CONTAINER LEFT ALHAMBRA MARKED. (5, 8, 9) RECORDS HAVE BEEN KEPT.

FAILURE, OPERATOR ERROR + *STORAGE CONTAINER

26328
AEC CITATION FOR NONCOMPLIANCE WITH RADIOGRAPHY REGULATIONS
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D. C.
4 PAGES, LETTER TO SARNIA INSPECTION COMPANY, LTD. FROM E.R. PRICE, OCTOBER 1, 1965

AN INSPECTION IN JUNE 1965 RESULTED IN CITATIONS FOR FAILING TO (1) LIMIT RADIATION LEVEL AT SURFACE OF SOURCE DEVICE, (2) SURVEY AFTER EXPOSURES, (3) POST RADIATION AREAS, (4) MAINTAIN UTILIZATION LOGS, (5) MAINTAIN RECORDS OF RECEIPT AND TRANSFER OF BYPRODUCT MATERIAL, (6) RECORD DOSIMETER DOSES, (7) PERFORM QUARTERLY INVENTORIES OF BY-PRODUCT MATERIAL, (8) PERFORM INSTRUMENT CALIBRATIONS, (9) PERFORM LEAK TESTS, (10) KEEP PERSONNEL-MONITORING RECORDS, (11) KEEP RECORDS OF SURVEYS CONDUCTED AT SITE, AND (12) KEEP RECORDS OF PERSONNEL TRAINING.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*RADIATION SAFETY AND CONTROL + *FAILURE, ADMINISTRATIVE CONTROL

26338
RESPONSE TO AEC CITATION FOR RADIOGRAPHY DEFICIENCIES
SARNIA INSPECTION COMPANY, SARNIA, ONTARIO
3 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSEE RELATIONS FROM T. ARNESEN, OCTOBER 26, 1965

AN AEC INVESTIGATION IN JUNE 1965, AND A CITATION FOR DEFICIENCIES, RESULTED IN COMPANY RESPONDING THAT (1) CRACKS SEEMINGLY DEVELOP OVERNIGHT IN THE LEAD-SHIELDED CAMERAS, RESULTING IN DOSE RATES IN EXCESS OF 50 MR/HR (ALL CAMERAS WILL BE REPLACED WITH THOSE USING DEPLETED URANIUM), (2) OPERATORS HAVE BEEN INSTRUCTED TO USE SURVEY METERS AFTER EXPOSURES, (3) SIGNS WILL BE POSTED DURING EXPOSURES. RECORD-KEEPING DEFICIENCIES AT THE ORANGE, TEXAS, OFFICE HAVE BEEN CORRECTED.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, EQUIPMENT + *FAILURE, OPERATOR ERROR + SOURCE, RADIATION + *STORAGE CONTAINER + *FAILURE, ADMINISTRATIVE CONTROL

26349
RADIOGRAPHY SOURCE LOST IN GULF OF MEXICO
SCHLUMBERGER WELL SURVEYING CORP., HOUSTON, TEXAS
1 PAGE, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM D.C. CHEATHAM, JUNE 22, 1964

A 0.4-MILLCURIE CO-60 SOURCE WAS ACCIDENTALLY LOST IN THE GULF OF MEXICO. THE SOURCE IS IN 45 FT OF WATER AT HUMBLE OIL AND REFINING COMPANY WELL NO. F-15. RECOVERY WOULD BE DIFFICULT AND COSTLY. PERMISSION TO LEAVE THE SOURCE IN PLACE WAS REQUESTED.

26349 *CONTINUED*
 USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)
 OCEAN AND SEA + *SOURCE, RADIATION, LOST

26348
 RADIOGRAPHY SOURCE LOST FOR ONE DAY
 SCHLUMBERGER WELL SURVEYING CORP., HOUSTON, TEXAS
 2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM O.C. CHEATHAM, SEPTEMBER 28, 1964

ON SEPTEMBER 12, 1964, A 1-CURIE CS-137 SOURCE WAS LOST OFF A TRUCK IN MARYLAND AND RECOVERED THE FOLLOWING DAY. NO ONE INVOLVED RECEIVED ANY RADIATION EXPOSURE. THE SOURCE SHIELD APPARENTLY HIT THE DOOR, SPRINGING THE LATCH ENOUGH TO RELEASE THE DOOR. THE DOOR WAS REINFORCED AND A DIFFERENT STYLE LATCH INSTALLED.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)
 FAILURE, EQUIPMENT + *SOURCE, RADIATION, LOST

26323
 RADIOGRAPHY SOURCE LOST IN GULF OF MEXICO
 SCHLUMBERGER WELL SURVEYING CORP., HOUSTON, TEXAS
 1 PAGE, TELEGRAM TO AEC REGION IV DIVISION OF COMPLIANCE FROM O.C. CHEATHAM, OCTOBER 6, 1964

A 5-CURIE PU SOURCE WAS LOST IN 200 FT OF WATER IN THE GULF OF MEXICO DURING HURRICANE HILDA. NO PERSONNEL INVOLVED. RECOVERY DOUBTFUL.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)
 OCEAN AND SEA + *SOURCE, RADIATION, LOST

26347
 RADIOGRAPHY SOURCE LOST IN 4,186 FT. WELL
 SCHLUMBERGER WELL SURVEYING CORP., HOUSTON, TEXAS
 2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM O.C. CHEATHAM, JUNE 17, 1965

ON JUNE 7, 1965, A 1-CURIE CS-137 SOURCE STUCK AT THE BOTTOM OF A 4186-FT WELL IN WEST VIRGINIA. RETRIEVAL EFFORTS WERE DISCONTINUED 5 DAYS LATER. THE BOTTOM 50 FT OF THE WELL WAS FILLED WITH CEMENT AND JUNK IRON TO PRECLUDE REENTRY. THE SOURCE MATERIAL HAD 5 CONTAINING SHELLS, OF WHICH ONE WAS PRESSURE TESTED AT 25,000 PSI. FRESH-WATER ZONES IN THE VICINITY ARE AT DEPTHS NO GREATER THAN 100 FT FROM THE SURFACE.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)
 *SOURCE, RADIATION, LOST

26346
 RADIOGRAPHY SOURCE LOST IN PACIFIC OCEAN
 SCHLUMBERGER WELL SURVEYING CORP., HOUSTON, TEXAS
 2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM O.C. CHEATHAM, AUGUST 6, 1965

ON AUGUST 1, 1965, A 1.5-CURIE CS-137 SOURCE WAS LOST IN A STANDARD OIL CO. OF CALIFORNIA WELL 12 MILES OFF THE COAST OF OREGON. THE SOURCE HAD 4 CONTAINING SHELLS, OF WHICH TWO WERE PRESSURE TESTED AT 25,000 PSI. THE 12,000-FT WELL WAS ABANDONED AS A DRY HOLE. THE BOTTOM 200 FT WAS PLUGGED WITH CEMENT CONTAINING JUNK IRON.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)
 *OCEAN AND SEA + *SOURCE, RADIATION, LOST

26320
 OVEREXPOSURE TO RADIOGRAPHERS
 SCHLUMBERGER WELL SURVEYING CORP., HOUSTON, TEXAS
 1 PAGE, TEX TO AEC DIVISION OF COMPLIANCE REGION IV FROM O.C. CHEATHAM, MAY 26, 1966

A MONTHLY DOSIMETRY REPORT SHOWED THAT EXPOSURES TO TWO INDIVIDUALS WERE 42 AND 3.5 REMS, APPARENTLY TO COLLIMATED BEAMS. A INVESTIGATION IS UNDERWAY.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)
 *PERSONNEL EXPOSURE, RADIATION + INCIDENT, NONREACTOR

26345
 RADIOGRAPHY SOURCE ABANDONED IN OKLAHOMA WELL
 SCHLUMBERGER WELL SURVEYING CORP., HOUSTON, TEXAS

26345 *CONTINUED*
2 PAGES, LETTER TO AEC, WASHINGTON, D. C. FROM D.C. CHEATHAM, SEPTEMBER 21, 1967

ON SEPT. 12, 1967, A 1.5-CURIE CS-137 SOURCE STUCK IN A WELL IN OKLAHOMA. FISHING OPERATIONS CONTINUED UNTIL SEPT. 18, WHEN IT WAS DETERMINED THAT THE SOURCE WAS CLEAR OF THE CENTER OF THE WELL AND THAT A 4-1/2-IN. CASING COULD BE RUN TO THE PRODUCING ZONE BELOW. TWENTY FEET OF CEMENT WAS SPOTTED BELOW AND ABOVE THE SOURCE, WHICH WAS AT A DEPTH OF 3520 FEET, AND THE SOURCE WAS ABANDONED.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*SOURCE, RADIATION, LOST

26344
RADIOGRAPHY SOURCE - LOST AND FOUND
SCHLUMBERGER WELL SURVEYING CORP., HOUSTON, TEXAS
1 PAGE, LETTER TO SCHLUMBERGER WELL SERVICES FROM K.N. THOMAS, OCTOBER 16, 1967

A SOURCE WAS PLACED ON THE BUMPER OF A TRUCK PARKED NEXT TO A SECOND TRUCK IN WHICH EQUIPMENT CALIBRATIONS WERE BEING PERFORMED. THE DRIVER DROVE OFF, NOT KNOWING THAT THE SOURCE WAS ON THE BUMPER OF HIS TRUCK, NOR DID HE KNOW THAT IT HAD FALLEN OFF ALONG THE WAY. THE SOURCE WAS FOUND SHORTLY THEREAFTER IN A DITCH BY ONE OF SEVERAL SEARCH PARTIES.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

FAILURE, OPERATOR ERROR + INCIDENT, HUMAN ERROR + *SOURCE, RADIATION, LOST

26329
FAILURE TO USE SURVEY METER RESULTS IN OVEREXPOSURE TO RADIOGRAPHER
SCOPE INSPECTION CO., INC., HOUSTON, TEXAS
2 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSE RELATIONS FROM D. THOMAS, MAY 11, 1967

ON APRIL 23, 1967, RADIOGRAPHER RECEIVED A WHOLE-BODY DOSE OF 6.1 REMS AND A CALCULATED DOSE OF 162 REMS TO THE LEFT HAND. SOURCE FAILED TO RETURN TO CAMERA, AND RADIOGRAPHER DID NOT USE SURVEY METER. WHEN FILM WAS PROCESSED, HE BECAME AWARE THAT THE SOURCE WAS STILL IN THE SNORKEL. HE GOT SURVEY METER, CUT PLASTIC SNORKEL, AND REPLACED THE SOURCE IN THE CAMERA.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

SOURCE, RADIATION + *PERSONNEL EXPOSURE, RADIATION + *INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR

26337
RESPONSE TO AEC CITATION FOR RADIOGRAPHY DEFICIENCIES
SCOPE INSPECTION CO., INC., HOUSTON, TEXAS
4 PAGES, LETTER TO AEC DIVISION OF COMPLIANCE FROM D. THOMAS, AUGUST 2, 1967

ON APRIL 27, 1967, RADIOGRAPHER RECEIVED A DOSE OF 6.1 REMS WHILE RETURNING A SOURCE TO SAFE WHICH HAD STUCK IN SNORKEL TUBE. COMPANY RESPONDED TO CITATION THAT (1) ALL EMPLOYEES HAD BEEN NOTIFIED OF INCIDENT AND THAT THE INDIVIDUAL HAD BEEN DISCHARGED (WHICH DID MORE GOOD THAN A WEEK OF LECTURES), (2) RETRAINING OF ALL RADIOGRAPHERS STARTED, (3) IF UNAUTHORIZED PERSONS VISIT EXPOSURE AREAS, RADIOGRAPHY WILL CEASE, (4) WEEKLY UNANNOUNCED INSPECTION AT ALL OF JOB SITES ARE NOW BEING MADE.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION + *FAILURE, ADMINISTRATIVE CONTROL

26394
LOST SOURCE USED FOR DENSITY GAUGE
THE SHERWIN-WILLIAMS CO., CHICAGO, ILLINOIS
1 PAGE, LETTER TO AEC DIV. OF COMPLIANCE FROM W. A. STARKOVICH, APRIL 2, 1968

IN EARLY DEC. 1967, COMPANY DISCOVERED THAT A 50-MILLCURIE CESIUM-137 SEALED SOURCE (PART OF A DENSITY GAUGE) WAS MISSING BUT FAILED TO NOTIFY AEC UNTIL MARCH 26, 1968. DURING THE INTERIM, AN EXTENSIVE SEARCH WAS MADE. ONE EMPLOYEE STATED THAT HE REMEMBERED CLEANING UP THE AREA AND HAD THROWN THE MATERIAL IN THE WASTE DUMPSTER. THE COMPANY WAS CITED FOR FAILURE TO NOTIFY.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

RADIATION SAFETY AND CONTROL + *SOURCE, RADIATION, LOST + FAILURE, ADMINISTRATIVE CONTROL

26391
RADIOGRAPHY INCIDENT AT SINCO TESTING INC.
SINCO TESTING INC., PORT HURON, MICHIGAN
4 PAGES, LETTER TO AEC DSLR FROM A. SAUCIER, OCTOBER 3, 1966

ON JULY 7, 1966, A RADIOGRAPHER RECEIVED AN ESTIMATED DOSE OF 4000 R TO THE SKIN OF HIS HANDS.

26391 *CONTINUED*

WHILE ATTEMPTING TO DISCONNECT A SOURCE FROM THE CONTROL CABLE, HE JERKED IT FROM THE STORAGE CONTAINER. THE 27-CURIE SOURCE LANDED IN HIS HAND AND MADE CONTACT FOR 1 SEC.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

SOURCE, RADIATION + *PERSONNEL EXPOSURE, RADIATION + *INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR

26336

RESPONSE TO AEC CITATION FOR DEFICIENCIES IN RADIOGRAPHY PROCEDURES

SINCO TESTING INC., PORT HURON, MICHIGAN

6 PAGES, LETTER TO AEC, WASHINGTON, D. C., OCTOBER 17, 1966

ON SEPT. 26, 1966, AEC CITED COMPANY FOR 33 DEFICIENCIES. COMPANY RESPONSE - (1) RECORDS NOW ARE ON FILE FOR INSTRUMENT CALIBRATIONS, QUALIFICATION RECORDS OF RADIOGRAPHERS, AND SOURCE LEAK TESTS, (2) STORAGE OF SOURCE IN UNLOCKED CAMERA OCCURRED BECAUSE OF SHORTAGE OF STORAGE CONTAINERS (THE SOURCE HAD DECAYED AND WAS READY TO BE SHIPPED TO SUPPLIER, AND THE LOCK WAS BEING REPAIRED), (3) RADIOGRAPHERS HAVE BEEN INSTRUCTED TO RECHARGE DOSIMETERS DAILY, AND (4) UNPOSTED AREAS HAVE BEEN POSTED.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*MONITOR, PERSONNEL + SOURCE, RADIATION + *STORAGE CONTAINER + *FAILURE, ADMINISTRATIVE CONTROL

13999

AEC SUSPENDS SINCO TESTING, INC. RADIOGRAPHY LICENSE

U. S. ATOMIC ENERGY COMMISSION

2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(2) PAGES 17-18 (JANUARY 5, 1967)

(LETTER DECEMBER 30) SINCO IS REQUIRED TO CEASE OPERATION PENDING INVESTIGATION. CHARGES INCLUDE ALLOWING 4 PERSONS TO OPERATE A 25-CURIE IR-192 RADIOGRAPHIC DEVICE WITHOUT HAVING CHECKED THEIR QUALIFICATIONS. ONE PERSON LEFT THE SOURCE UNRETRACTED ON DECEMBER 12, 1966, AND SINCO FAILED TO PROCESS HIS FILM BADGE OR RESTRICT HIM FROM FURTHER RADIATION AFTER FINDING HIS POCKET METERS DISCHARGED.

FAILURE, OPERATOR ERROR + MONITOR, PERSONNEL + REGULATION, AEC + PERSONNEL EXPOSURE, RADIATION + *INCIDENT, HUMAN ERROR + *FAILURE, ADMINISTRATIVE CONTROL

26390

RADIATION EXPOSURE IS QUESTIONABLE

WARD W. SPARROW HOSPITAL, LANSING, MICHIGAN

2 PAGES, LETTER TO AEC DIVISION OF COMPLIANCE FROM J. C. SPENCER M.D., JANUARY 14, 1965

A FILM-BADGE REPORT FOR THE PERIOD 10-26-64 THROUGH 11-8-64 INDICATED THAT ONE EMPLOYEE'S BADGE WAS TOO DARK TO READ. DARKENING OF THE FILM IN THE BADGE TO THAT DEGREE REQUIRES AN EXPOSURE OF 500 TO 1000 R. INVESTIGATION AND QUESTIONING OF THE EMPLOYEE FAILED TO PROVIDE AN EXPLANATION. THE EMPLOYEE IS WELL, AND BLOOD COUNTS ARE NORMAL. THE FILM BADGE MAY HAVE BEEN DEFECTIVE.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*PERSONNEL EXPOSURE, RADIATION + INCIDENT, NONREACTOR

26335

RESPONSE TO AEC CITATION FOR DEFICIENCIES IN RADIOGRAPHY PROCEDURES

SUPERIOR STEEL CASTINGS COMPANY, BENTON HARBOR, MICHIGAN

2 PAGES, LETTER TO AEC, WASHINGTON, D. C. FROM C.E. WESTIN, OCTOBER 2, 1963

COMPANY RESPONSE - (1) A LOCK WAS INSTALLED ON THE CRANK TO ENSURE SAFE STORAGE OF THE SOURCE. (2) THE SOURCE WAS LEAK-TESTED ON APRIL 16 AND SEPT. 9, 1963. (3) DOSIMETER DOSES ARE RECORDED DAILY. (4) SURVEYS ARE MADE AND RECORDED ACCORDING TO REGULATIONS.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*SOURCE, RADIATION + *STORAGE CONTAINER + FAILURE, ADMINISTRATIVE CONTROL

26389

RADIATION DAMAGE TO HANDS DISCOVERED 2 WEEKS AFTER EXPOSURE

TECHNICAL OPERATIONS RESEARCH, BURLINGTON, MASSACHUSETTS

7 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM E. T. CLARKE, APRIL 16, 1965

THE RIGHT HANDS OF TWO MEN BECAME SWOLLEN AND TENDER 2 WEEKS AFTER AN ESTIMATED EXPOSURE OF 250 R GAMMA AND 1000 RADS BETA. TO DISLodge IRRADIATED IRIIDIUM PELLETS ADHERING TO AN ALUMINUM SPOOL BY CORROSION, THE MEN STOOD BEHIND A LEAD SHIELD AND TOOK TURNS FOR 10 MIN RAPPING THE CAPSULE CORE AGAINST THE INNER WALL OF A LEAD CONTAINER. TEN-INCH=LONG TWEEZERS WERE USED, BUT THE HANDS WERE IMMEDIATELY ABOVE THE ACTIVITY. NEITHER MAN WORE FILM BADGES OR DOSIMETERS. FUTURE HANDLING TO BE DONE UNDER SURVEILLANCE OF RADIATION SAFETY OFFICER.

26389 *CONTINUED*
USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

SOURCE, RADIATION + CORROSION + *PERSONNEL EXPOSURE, RADIATION + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR

31542
NON COMPLIANCE CITATION FOR RADIOGRAPHY
U. S. ATOMIC ENERGY COMMISSION
3 PAGES, LETTER TO E. S. TELLONE, X-RAY ENGINEERING CORPORATION, SEPTEMBER 25, 1968

A JULY 1968 INSPECTION AT HUNTERS POINT NAVAL SHIPYARD GAVE 6 ITEMS OF NONCOMPLIANCE - (6) LICENSED SOURCES USED IN CAMERAS NOT LICENSED, (5) RADIOGRAPHERS ASSISTANT UNTRAINED, (4,3) HIGH-RADIATION AREA NOT POSTED OR OBSERVED, (2,1) RADIATION SURVEYS NOT MADE. *** AN OBSERVER WAS ALLOWED TO REMAIN AT CONTROLS WITH RADIOGRAPHER INSIDE HULL. PLACING OF FILM WAS BY HAMMER KNOCKS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D. C. 20545 (\$0.25 CENTS/PAGE)

*HEALTH PHYSICS TRAINING + *FAILURE, OPERATOR ERROR + SURVEY, RADIATION + PERSONNEL EXPOSURE, RADIATION + *FAILURE, ADMINISTRATIVE CONTROL + COMMUNICATION SYSTEM

31568
DEFICIENCIES IN CONTAINMENT CONSTRUCTION
U. S. ATOMIC ENERGY COMMISSION
2 PAGES, LETTER - AEC TO TVA - FEBRUARY 14, 1969, DOCKETS 50-259/296, TYPE--BWR, MFG--G.E., AE--TVA

INSPECTIONS IN SEPT. AND NOV. 1968 SHOWED DEFICIENCIES IN IMPLEMENTATION OF QUALITY ASSURANCE. RADIOGRAPHIC RECORDS WERE ERRONEOUS AND WENT UNDETECTED OVER AN EXTENDED PERIOD OF TIME BUT WERE DETECTED BY TVA AND RESULTED IN RETAKING 3000 RADIOGRAPHS. OVERPRESSURE AND LEAK-RATE TESTS WERE QUESTIONABLE (PROCEDURES WERE NOT FOLLOWED AND RESPONSIBLE PERSONNEL WERE NOT FULLY INFORMED ON ASPECTS OF TESTS). REQUESTS ADDITIONAL INFO ON QUALITY-ASSURANCE PROGRAM AND COMMITTEE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20545 (\$0.25 CENTS/PAGE)

FABRICATION + TEST, PRESSURE VESSEL + *CONTAINMENT CONSTRUCTION + CONSTRUCTION PERMIT PROCESS + CONTAINMENT STRUCTURE + TEST, NONDESTRUCTIVE + *FAILURE, ADMINISTRATIVE CONTROL + QUALITY ASSURANCE + BROWNS FERRY 1 (BWR) + BROWNS FERRY 3 (BWR)

26385
CONTAMINATION FROM LEAKING RADIOGRAPHY SOURCE
TWIN CITY TESTING AND ENGINEERING LABORATORY, INC., ST. PAUL, MINNESOTA
2 PAGES, LETTER TO AEC, WASHINGTON, D.C. FROM H. T. SCHULZE, SEPTEMBER 30, 1966

AFTER FILM WAS FOUND FOGGED WHILE STORED NEXT TO THE SOURCE TUBES AND CONTROL CABLES, CONTAMINATION FROM A LEAKING IRIIDIUM-192 SOURCE WAS FOUND ON THE PLANT FLOORS AND SOURCE STORAGE PIGS. ALSO, TRUCKS PARKED IN THE BACK OF THE PLANT WERE CONTAMINATED TO 5-10 MR/HR BY DIRECT READING. A TARPULIN IN THE TRUNK OF A WORKMANS PRIVATE CAR CONTAINED ACTIVITY UP TO 100 C/SECOND. A SINGLE IRIIDIUM PARTICLE WAS FOUND IN THE DRIVEWAY, WHICH READ 1300 MR/HR. HEALTH PHYSICIST RECOMMENDED THAT CABLES BE SURVEYED EACH TIME THEY ARE REMOVED FROM THE SHIELDED CONTAINER TO PREVENT SUCH INCIDENT.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, EQUIPMENT + *SOURCE, RADIATION + *CONTAMINATION + RADIATION SAFETY AND CONTROL + *FAILURE, ADMINISTRATIVE CONTROL

26387
RESPONSE TO AEC CITATION FOR NONCOMPLIANCE IN RADIOGRAPHY PROCEDURES
TWIN CITY TESTING AND ENGINEERING LABORATORY, INC., ST. PAUL, MINNESOTA
3 PAGES, LETTER TO AEC DIVISION OF COMPLIANCE FROM C. W. BRITZIUS, JANUARY 22, 1968

AEC COMPLIANCE CITED FOUR ITEMS OF NONCOMPLIANCE - (1) RADIOGRAPHER FAILED TO LOCK EXPOSURE DEVICE AFTER EXPOSURE, AND FAILED TO REPORT DISCHARGE OF DOSIMETER, (2) SURVEY WAS NOT MADE TO DETERMINE EXTENT OF DOSE RECEIVED BY RADIOGRAPHER, (3) AEC NOT NOTIFIED IMMEDIATELY OF EXPOSURE INCIDENT, AND (4) STORAGE OF MATERIAL AT PLACE NOT SPECIFIED BY LICENSE. COMPANY RESPONSE - (1) ITEM REVIEWED WITH ALL RADIOGRAPHERS, (2) SURVEY TECHNIQUES WERE REVIEWED AND RADIOGRAPHERS INSTRUCTED TO LEAVE SURVEY METERS ON AT ALL TIMES, (3) FAILED TO MARK ENVELOPE CONTAINING BADGE, SO THAT RESULTS OF READING WERE DELAYED, (4) COMPANY MOVED 2 BLOCKS AWAY AND NEGLECTED TO INFORM AEC.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

FAILURE, OPERATOR ERROR + *RADIATION SAFETY AND CONTROL + *FAILURE, ADMINISTRATIVE CONTROL

60005
TWIN CITY TESTING AND ENGINEERING LAB. CITED FOR NONCOMPLIANCE
U.S. ATOMIC ENERGY COMMISSION
2 PAGES, LETTER - U.S. ATOMIC ENERGY COMMISSION TO TWIN CITY TESTING AND ENGINEERING LABORATORY - DECEMBER 1,

60005 *CONTINUED*
1970

TWIN CITY TESTING AND ENGINEERING LAB CITED FOR 4 ITEMS OF NONCOMPLIANCE. 2 RADIOGRAPHERS HAD NOT PASSED WRITTEN TESTS. SOURCE STORED IN UNAUTHORIZED LOCATION. UTILIZATION LOGS WERE NOT KEPT AT PROPER ADDRESS. QUARTERLY INVENTORIES OF SEALED SOURCES WERE NOT KEPT PROPERLY.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*FAILURE, ADMINISTRATIVE CONTROL + SOURCE, RADIATION + STAFFING + TRAINING + CERTIFICATION + RECORDS

61440
TWIN CITY TESTING AND ENGINEERING LABORATORY ANSWERS LETTER OF NON-COMPLIANCE
TWIN CITY TESTING AND ENGINEERING LABORATORY, INC.
2 PAGES, LETTER - TWIN CITY TESTING AND ENGINEERING LABORATORY, INC. TO DIVISION OF COMPLIANCE (AEC) - DECEMBER 2, 1971

A LIST OF QUALIFIED PERSONNEL WILL BE PREPARED FOR USE IN SCHEDULING RADIOGRAPHERS. AN AMENDMENT TO THE LICENSE HAS BEEN REQUESTED AUTHORIZING STORAGE OF SOURCES IN A NEW LOCATION. UTILIZATION LOGS WILL BE KEPT ON FILE AT THE ST. PAUL LABORATORY INSTEAD OF THE FIELD OFFICES.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*SOURCE, RADIATION + *TESTING + *DATA COLLECTION

26386
FORGETFULNESS RESULTS IN OVEREXPOSURE TO RADIOGRAPHER
TWIN CITY TESTING AND ENGINEERING LABORATORY, INC., ST. PAUL, MINNESOTA
3 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSE RELATIONS FROM H. T. SCHULZE, NOVEMBER 2, 1967

AFTER PERFORMING 15 EXPOSURES, RADIOGRAPHER SURVEYED IN THE USUAL MANNER TO ASCERTAIN THAT SOURCE WAS IN THE SAFE POSITION, BUT THIS ONE TIME HE FORGOT TO PUSH THE KEY-OPERATED LOCK IN, WHICH WOULD LOCK THE SOURCE IN THE EXPOSURE DEVICE. DURING THE TRANSFER TO ANOTHER LOCATION, THE CRANK CAUGHT ON AN OBSTRUCTION AND FORCED THE SOURCE TO AN EXPOSED POSITION. WHILE SETTING UP FOR THE NEXT EXPOSURE HIS FILM BADGE IN THE SHIRT POCKET WAS 3 FT FROM THE 90-CURIE SOURCE. HIS LEFT THIGH WAS 6 TO 12 IN. AWAY. FILM BADGE READ 8.8 REMS. ESTIMATED DOSE TO THIGH WAS 70 REMS.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

SOURCE, RADIATION + *PERSONNEL EXPOSURE, RADIATION + *INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR

61902
HIGH FILM BADGE READING AT UNIVERSAL TECHNICAL TESTING LABORATORIES
UNIVERSAL TECHNICAL TESTING LABORATORIES, INC., COLLINGDALE, PENNSYLVANIA
2 PAGES, LETTER - UNIVERSAL TECHNICAL TESTING LABORATORIES TO DIVISION OF COMPLIANCE (AEC) - JANUARY 6, 1971

A DOSE OF 1.6 REMS WAS INDICATED BY THE FILM-BADGE READING FOR A TECHNICIAN. HE DROPPED HIS BADGE WHILE SETTING UP AN EXPOSURE AND DID NOT MISS IT FOR 5 HR. DURING THIS TIME THE BADGE WAS CLOSE TO THE SOURCE, WHILE THE TECHNICIAN WAS AT A NORMAL SAFE DISTANCE. NO OVEREXPOSURE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + *FAILURE, OPERATOR ERROR + PERSONNEL PROTECTIVE DEVICE + MONITOR, PERSONNEL

63638
TWO RADIOGRAPHERS OVEREXPOSED TO RADIATION (IN-192).
UNIVERSAL TECHNICAL TESTING LABS. COLLINGDALE, PA.
3 PAGES, LETTER OF COMPLIANCE (AEC) FROM UNIVERSAL TECHNICAL TESTING LABS., INC., P. O. BOX 372, COLLINGDALE, PA 19203 (APRIL 27, 1971)

BOTH MEN WERE ASSIGNED TO A JOB CALLING FOR RADIOGRAPHY OF PIPE WELDS AT AN OIL REFINERY CONSTRUCTION SITE. ON THE DATE WHEN THE OVEREXPOSURE OCCURRED, WELDS AT ELEVATED LEVELS WERE BEING TESTED. THE LEAD RADIOGRAPHER, WHO HAS NEARLY 15 YEARS EXPERIENCE WITH ISOTOPE RADIOGRAPHY WAS IN CHARGE. THE SECOND MAN, WHO HAS 3-1/2 YEARS EXPERIENCE, ACTED AS ASSISTANT. THEY RECEIVED 2070 AND 930 MR RESPECTIVELY.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + IRIIDIUM + FAILURE, OPERATOR ERROR

09562
MULLIKIN MS
RADIOGRAPHY OVEREXPOSURE, UNIVERSAL TESTING COMPANY, MARCH 10, 1966

09562 *CONTINUED*
UNIVERSAL TESTING COMPANY
2 PAGES, APRIL 8, 1966, ATOMIC ENERGY CLEARING HOUSE, 12(18), PP. 27-28 (MAY 2, 1966)

A TRAINEE FAILED TO CONNECT THE CONTROL CABLE TO THE SOURCE CABLE, SO THE SOURCE REMAINED OUT OF THE SHIELDING AFTER THE FIRST WELD RADIOGRAPH. AFTER FIVE EXPOSURE SETUPS, THE SURVEY METER WAS BROUGHT OUT OF THE TRUCK, AND CONDITION FOUND. RADIOGRAPHER SHOOK SOURCE OUT OF TUBE AND RETURNED TO SHIELD. RADIOGRAPHERS FILM BADGE READ 0.935 REM, ESTIMATED WHOLE BODY DOSE 3 REMS, AND RIGHT HAND 20 REM. TRAINEE ADJUSTED SOURCE TUBE FOR EACH SETUP, FILM BADGE READ 4.27 REMS, ESTIMATED 176 REMS TO KNEES, AND 40 TO GONADS.

FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION + *INCIDENT, HUMAN ERROR + FAILURE, DESIGN ERROR

09277
MULLIKIN MS
OVEREXPOSURE AT UNIVERSAL TESTING COMPANY, MARCH 11, 1966
UNIVERSAL TESTING COMPANY, SALT LAKE CITY, UTAH
1 PAGE, ATOMIC ENERGY CLEARING HOUSE, 12(16) PAGE 30, APRIL 18, 1966

TWO PERSONS WERE EXPOSED WHEN THEY FAILED TO CONNECT CONTROL CABLE AND SOURCE CABLE, FORCING THE SOURCE TO END OF THE CABLE UNTIL RECOVERED BY HAND.

*FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION

24206
MULLIKIN MS
TWO RADIOGRAPHERS OVER EXPOSED DURING FOURTH QUARTER 1967
UNIVERSAL TESTING CO., INC., SALT LAKE CITY, UTAH
1 PAGE, JAN. 22, 1968, ATOMIC ENERGY CLEARING HOUSE, 14(12), PAGE 28 (MARCH 18, 1968)

(LETTER, JAN. 22) DOSES OF 2.273 AND 1.59/REMS WERE RECEIVED BY RADIOGRAPHERS DURING THE QUARTER AS A RESULT OF MECHANICAL PROBLEMS WITH A CAMERA. THE EXTENSION ADAPTER WAS TOO LONG FOR PROPER ATTACHMENT OF THE CONTROL CABLE TO THE SOURCE CABLE, AND THE THREADS IN THE CAMERA PULLED OUT, CAUSING THE SOURCE CONNECT AND DISCONNECT TO HANG. THE RADIOGRAPHERS THEN HAD TO WORK THE SOURCE CABLE BACK AND FORTH UNTIL IT CAME FREE. THE SOURCE WAS EXPOSED DURING THIS TIME. THESE TIMES WERE SHORT, BUT THERE WERE SEVERAL DURING THE QUARTER. THE CAMERA WAS RETURNED FOR REPAIR.

*FAILURE, EQUIPMENT + SOURCE, RADIATION + PERSONNEL EXPOSURE, RADIATION + INCIDENT, NONREACTOR

31546
RADIOGRAPHY INCIDENT AUGUST 20, 1968
UNIVERSAL TESTING COMPANY
2 PAGES, LETTER TO L. D. LOW, COMPLIANCE, SEPTEMBER 17, 1968

(NEAR MOAB, UTAH.) THE CASTING ON THE DISCONNECT BROKE, SEPARATING SOURCE AND ITS CABLE FROM CONTROL CABLES. RADIOGRAPHER MAKING SURVEY AFTER RETRACTING CONTROL CABLE FOUND SOURCE OUT IN ITS TUBE. HE LAID 3 SHEETS OF 1/8-IN.-THICK LEAD OVER TUBE, SHOOK OUT SOURCE WITH A 50-FT STICK, PICKED IT UP WITH A 1-FT STICK, AND PLACED IN CAMERA. HE CALLED RADIATION OFFICER, WHO SENT NEW SOURCE AND FILM BADGES. FILM BADGES READ 4.765 REMS (RADIOGRAPHER) AND 0.478 REMS (ASSISTANT). RADIOGRAPHER HAS BEEN REMOVED FROM DUTY FOR REMAINDER OF QUARTER.

AVAILABILITY - USAEC PUBLIC DOCUMENT RDCM, 1717 H ST., WASHINGTON, D. C. 20545 (\$0.25 CENTS/PAGE)

*INCIDENT, EXPOSURE + *FAILURE, EQUIPMENT + SOURCE, RADIATION + INCIDENT, RECOVERY FROM + SHIELDING + REMOTE MANIPULATING AND VIEWING

32286
RADIOGRAPHER OVEREXPOSURE
UNIVERSAL TESTING COMPANY
1 PAGE, LETTER TO L.D. LOW, AEC COMPLIANCE, OCTOBER 1, 1968

ONE RADIOGRAPHER RECEIVED 1.846 REMS IN 2 MONTHS (1.323 IN AUGUST FROM RETRIEVING SOURCES THAT WERE STUCK OUT INTO THE SOURCE TUBE). ANOTHER RECEIVED 1.391 IN 3 MONTHS, 0.507 WHILE RETRIEVING A 92-C IR-192 SOURCE THAT WAS OUT IN THE SOURCE CABLE AFTER THE CRANK SHEARED A PIN. HE RETURNED THE SOURCE TO A SAFE POSITION, PULLING THE CABLE BY HAND.

AVAILABILITY - USAEC PUBLIC DOCUMENT RDCM, 1717 H ST., WASHINGTON, D.C. 20545, (\$0.25 CENTS/PAGE)

*FAILURE, EQUIPMENT + *PERSONNEL EXPOSURE, RADIATION + INCIDENT, RECOVERY FROM

31545
NON COMPLIANCE CITATION FOR RADIOGRAPHY
U. S. ATOMIC ENERGY COMMISSION
4 PAGES, LETTER TO M. MULLIKIN, UNIVERSAL TESTING CO., OCTOBER 3, 1968

SEPT. INSPECTION REVEALED 13 ITEMS OF NONCOMPLIANCE, INCLUDING (1,2,3) REEXPOSURE OF A PERSON WHO HAD RECEIVED 4.8 REMS IN AN AUG. 20 INCIDENT, NOT DEVELOPING HIS FILM BADGE PROMPTLY, OR

31545 *CONTINUED*

EVALUATING DOSE IN REPLACING SOURCE IN SHIELD, (4) SOURCE-RECOVERY PROCEDURES NOT FOLLOWED DURING INCIDENTS OF AUG. 20, 28, 31, (6,7) SOURCES NOT LEAK-TESTED SEMIANNUALLY OR INVENTORIED, (5,8) RADIOGRAPHER OPERATED WITHOUT FILM BADGE OR WITH PARTIALLY DISCHARGED DOSIMETER, (10,11) HI-RADIATION AREA NOT POSTED NOR UNDER SURVEILLANCE. *** SEVERAL ITEMS ARE RECURRENT TO THOSE NOTED JANUARY 1968, WHICH WE NOTIFIED YOU INDICATED INADEQUATE MANAGEMENT CONTROL OF RADIATION SAFETY.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D. C. 20545 (\$0.25 CENTS/PAGE)

*INCIDENT, EXPOSURE + EMERGENCY PROCEDURE + *RADIATION SAFETY AND CONTROL + *FAILURE, ADMINISTRATIVE CONTROL

32285

CORRECTIVE ACTION FOLLOWING NONCOMPLIANCE CITATION OCTOBER 3, 1968

UNIVERSAL TESTING COMPANY

2 PAGES, LETTER TO L.C. LOW, AEC COMPLIANCE, OCTOBER 18, 1968

ACTIONS INCLUDE - (1,2) INDIVIDUALS WILL NOT DO RADIATION WORK FOLLOWING INCIDENT. INCIDENT WILL BE REENACTED TO GET DOSE ESTIMATES. (10) WE NOW RADIOGRAPH ON THE MIDNIGHT SHIFT. RADIOGRAPHERS WILL CEASE OPERATION IF THEY CANNOT CONTROL PERIMETERS. *** COMPANY HAS BEEN ORGANIZED AND NEW PEOPLE HIRED. I (PRESIDENT) HAVE SEPARATED FROM PRODUCTION WORK TO MANAGE COMPANY AND CONTROL RADIATION SAFETY. COMPANY POLICY HAS BEEN REVIEWED WITH EMPLOYEES, AND I WILL MAKE FREQUENT INSPECTIONS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545, (\$0.25 CENTS/PAGE)

*ADMINISTRATIVE CONTROL + RADIATION SAFETY AND CONTROL + FAILURE, ADMINISTRATIVE CONTROL

04930

NONCOMPLIANCE WITH LICENSE REQUIREMENTS FOR RADIATION SAFETY

U.S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE

1 PAGE, LETTER - DIVISION OF COMPLIANCE (AEC) TO UNIVERSAL TESTING COMPANY - AUGUST 11, 1970

AN INVESTIGATOR REVEALED THE FOLLOWING DEFICIENCIES - THE SOURCE WAS NOT RETURNED TO A SHIELDED POSITION AND NO SURVEY WAS MADE FOLLOWING RADIOGRAPHIC EXPOSURE. THE SOURCE WAS NOT SECURED TO PREVENT TAMPERING OR REMOVAL. A RADIOGRAPHER RECEIVED THE FOLLOWING EXPOSURE BECAUSE THE SOURCE WAS NOT RETURNED TO ITS SHIELDED POSITION - HANDS 6.038 REMS, RIGHT SIDE 7.234 REMS, GONADS 2.994 REMS, FACE 0.776 REM., FILM BADGE (ON LEFT SIDE) 1.3 REMS. CAUSE - DIFFICULTIES BETWEEN THE MAN AND HIS HELPER.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

PERSONNEL EXPOSURE, RADIATION + FAILURE, OPERATOR ERROR + SOURCE, RADIATION + IRIIDIUM + BEHAVIOR + OPERATOR ACTION + SURVEY, RADIATION

63800

NONCOMPLIANCE CITATION FOR USE OF BYPRODUCT MATERIAL

U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.

LETTER TO UNIVERSITY OF HAWAII FROM U.S. ATOMIC ENERGY COMMISSION +. 3 PAGES, APRIL 7, 1971

VIOLATIONS NOTED DURING INSPECTION OF FEB. 2-3, 1971, INCLUDE STORAGE IN AN UNAUTHORIZED LOCATION, INCOMPLETE RECORDS ON MATERIAL DISPOSED OF AT SEA, USE OF CARBON-14 IN AN UNAUTHORIZED LOCATION, AND USE OF MATERIAL WITHOUT SUPERVISION OF AUTHORIZED PERSONS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*CARBON + *FAILURE, ADMINISTRATIVE CONTROL + *PROCEDURES AND MANUALS + OPERATING EXPERIENCE

26395

SOURCE DAMAGED - STARTS LEAKING

UNIVERSITY OF MINNESOTA, MINNEAPOLIS, MINNESOTA

1 PAGE, LETTER TO AEC DIVISION OF MATERIALS LICENSING FROM J. W. STAIGER, MARCH 22, 1967

ON MARCH 8, 1967, A 4-CURIE IRIIDIUM-192 SOURCE WAS DAMAGED AND STARTED LEAKING. THE SOURCE WAS ATTACHED TO A ROD USED TO PUSH IT THROUGH TWO CYLINDRICAL LEAD VALVES INTO A VAN DE GRAAFF ACCELERATOR TANK. IN RETRACTING THE SOURCE INTO ITS LEAD SHIELD, IT WAS WITHDRAWN ONLY PARTIALLY, AND, IN CLOSING A VALVE, THE SOURCE WAS CLIPPED OFF, ALLOWING POWDERED IRIIDIUM TO LEAK INTO THE SPACE BETWEEN SHIELD AND STEEL CASING. UNIT WRAPPED IN POLYETHYLENE BAGS FOR DISPOSAL.

*FAILURE, OPERATOR ERROR + *SOURCE, RADIATION + *CONTAMINATION + *DAMAGE

61443

LEAKING SOURCE AT THE UNIVERSITY OF WISCONSIN

THE UNIVERSITY OF WISCONSIN

1 PAGE, LETTER - THE UNIVERSITY OF WISCONSIN TO DIVISION OF REACTOR LICENSING (AEC) - JANUARY 14, 1971

61443 *CONTINUED*

A 50 M CI SR-90 SOURCE WAS FOUND TO HAVE 0.12 MICROCURIE OF REMOVABLE CONTAMINATION. IT HAS BEEN SEALED IN A PLASTIC BAG PENDING REPAIR OR DISPOSAL.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

FAILURE, EQUIPMENT + *SOURCE, RADIATION + *LEAK + COLLEGES AND UNIVERSITIES

63792

SOURCE STOLEN AT U OF WISCONSIN

U. S. ATOMIC ENERGY COMMISSION, WASHINGTON D.C.

LETTER TO DIVISION OF COMPLIANCE FROM THE UNIVERSITY OF WISCONSIN +. 4 PAGES, APRIL 23, 1971

A 1.6-MILLICURIE SOURCE VALUED AT \$1.50 WAS STOLEN ALONG WITH SOME ELECTRONIC EQUIPMENT FROM A LOCKED PHYSICS LABOARTORY. THE SOURCE WAS IN A SHIELDED CONTAINER. UNIVERSITY WORKERS WERE CAUTIONED TO USE PROPER SECURITY MEASURES IN SAFEGUARDING SOURCE MATERIALS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

COLLEGES AND UNIVERSITIES + SOURCE, RADIATION, LOST

48874

CESIUM RADIOGRAPHIC SOURCE STUCK IN IRRADIATING POSITION

DEPARTMENT OF AGRICULTURE

1 PAGE, TELEGRAM - DEPARTMENT OF AGRICULTURE TO DIVISION OF COMPLIANCE (AEC) - JUNE 4, 1970

NO WORKERS EXPOSED TO 1500-CURIE SOURCE. WILL PROBABLY TAKE 24 HOUR TO RETURN IT TO SHIELDED POSITION.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*CESIUM + *FAILURE, EQUIPMENT

26311

OVEREXPOSURE TO FILM BADGE WHILE CALIBRATING INSTRUMENTS

U.S. ARMY, FORT MCPHERSON

4 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM G.L. GALLIER, MARCH 25, 1965

A FILM-BADGE REPORT INDICATED AN EXPOSURE OF 41 REMS (BETA). INVESTIGATION REVEALED THAT EXPOSURE WAS TO FILM BADGE ONLY AND OCCURRED EITHER WHEN OPERATOR PERFORMING INSTRUMENT CALIBRATION LEFT HIS BADGE ON THE TABLE NEXT TO THE SOURCE FOR AN INDEFINITE TIME, OR WHEN HE LEANED OVER THE CALIBRATOR WHILE ITS PORT WAS OPEN AND THE BADGE WAS ON HIS BELT OVER THE FRONT OF THE RIGHT HIP.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, OPERATOR ERROR + *MONITOR, PERSONNEL + *INSTRUMENT CALIBRATION + *PERSONNEL EXPOSURE, RADIATION

16327

RUST INHIBITOR CAUSES OVEREXPOSURE

U.S. ARMY, U.S. ARMY NUCLEAR DEFENSE LABORATORY, EDGEWOOD ARSENAL, MARYLAND

3 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSEE RELATIONS FROM E.G. WRIGHT, MAY 29, 1967

A 700-CURIE CO-60 SOURCE STUCK DURING TRANSFER FROM A STORAGE SHIELD TO AN OPERATIONS SHIELD. DECOMPOSED RUST INHIBITOR CAUSED IT TO JAM IN THE HYDRAULIC-TRANSMISSION TUBING. THE SUPERVISOR TRIED VARIOUS MEANS OF FREEING THE SOURCE IN THE MEASURED 2-R/HR FIELD, AFTER MONITORING WITH AN AMERICAN-NUCLEAR HIGH-RANGE (0.100 R/HR) SURVEY METER, BUT FINALLY SENT THE PARTIALLY SHIELDED SOURCE TO A HOT CELL. HE THEN FOUND HIS 5-R DOSIMETERS OFF-SCALE (AND APPARENTLY ONLY THEN INFORMED RADIATION PROTECTOR OFFICER). THE SURVEY-METER NEON LIGHT WAS NOT LIT, SHOWING LOW BATTERY VOLTAGE, WHICH CAUSED THE METER TO READ 30-40 R/HR IN FIELDS OF 55-500 R/HR. RUST INHIBITOR IS NO LONGER USED. PERIODIC INSPECTIONS TO SHOW DEBRIS-FREE HANDLING MECHANISM, BETTER MARKING OF BATTERY INDICATOR, ADDITIONAL TRAINING IN EMERGENCY PROCEDURES WERE INSTITUTED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, EQUIPMENT + SOURCE, RADIATION + *PERSONNEL EXPOSURE, RADIATION + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR + INCIDENT, RECOVERY FROM + *FAILURE, ADMINISTRATIVE CONTROL + *REMOTE MANIPULATING AND VIEWING

30045

CARTER WP

LTR TRANSMITTING FINAL REPORT OF POSSIBLE OVER-EXPOSURE TO IONIZING RADIATION

ARMED FORCES RADIOBIOLOGY RESEARCH INSTITUTE

4 PAGES, LETTER TO DIRECTOR, USAEC DIVISION OF COMPLIANCE RELATIONS, JULY 15, 1968

30045 *CONTINUED*

BLOOD AND BONE MARROW CYTOGENIC STUDIES (NO CHROMOSOME ABNORMALITIES) INDICATE THAT A FILM BADGE READING OF 74 REMS MARCH-APRIL 1968 DID NOT AFFECT THE WEARER. PERSON BELIEVES HE DROPPED BADGE QUITE CLOSE TO A CO-60 SOURCE, HAVING FOUND IT THERE ONCE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, DC 20545 (\$0.25 CENTS/PAGE)

COBALT + MONITOR, PERSONNEL + PERSONNEL EXPOSURE, RADIATION

11612

ACCIDENTAL X-RAY EXPOSURE

DIVISION OF OPERATIONAL SAFETY, USAEC, WASHINGTON, D. C.

SERIOUS ACCIDENTS ISSUE NO. 251, 4 PAGES, 2 FIGURES, AUGUST 20, 1965, DPI

DESCRIBES OVEREXPOSURES TO X-RAYS. A SHORT DEVELOPED, PERMITTING CONTINUOUS BEAM PRODUCTION BY THE BYPASSING OF ALL INTERLOCKS AND CONTROLS. TWO OPERATORS RECEIVED CLASS-B SKIN EXPOSURES. NOTHING WAS FOUND EXCEPT FOR REDNESS ON THE END OF ONE MANS THUMB.

CONTROL SYSTEM + FAILURE, EQUIPMENT + *INCIDENT, EQUIPMENT + INCIDENT, NONNUCLEAR + *X-RAY

26382

FARY EJ

INADEQUATE SURVEY RESULTS IN OVEREXPOSURE TO RADIOGRAPHER

U.S. NAVY

3 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM COMMANDER OF SAN FRANCISCO BAY NAVAL SHIPYARD, JULY 7, 1965

DURING THE MIDNIGHT TO 8 AM SHIFT ON JUNE 10, 1964, A RADIOGRAPHERS HELPER RECEIVED A DOSE OF 12.5 REMS, THE RADIOGRAPHER 0.09. AFTER AN EXPOSURE, THE SOURCE DID NOT COMPLETELY RETURN TO THE SHIELD, AND AN INADEQUATE SURVEY FAILED TO REVEAL THE NARROW RADIATION BEAM. THE CONNECTOR OF THE SHIELDING NOZZLE WAS MISALIGNED, WHICH COULD CAUSE THE SOURCE TO HANG IN THE PARTIALLY SHIELDED POSITION. THE SURVEY METER HAD A RESPONSE LAG TIME WHEN SWITCHED FROM OFF TO ON, WHICH MAY HAVE CONTRIBUTED TO INADEQUATE SURVEY.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

FAILURE, EQUIPMENT + FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR

26380

SEQUENCE OF EVENTS LEADS TO OVEREXPOSURE

U.S. NAVY

5 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM E. FARY, DECEMBER 17, 1965

RADIOGRAPHS WERE BEING MADE OF A SUBMARINE UNDERGOING OVERHAUL IN DRYDOCK. ALL WORKMEN HAD LEFT FOR LUNCH. ROPE BARRICADES AND WARNING SIGNS HAD BEEN SET UP, A 4-MIN. EXPOSURE STARTED, AND THE 2 RADIOGRAPHERS WERE ON GUARD TO PREVENT ENTRY INTO THE RADIATION AREA. NO ANNOUNCEMENT OF THE RADIOGRAPHY WAS MADE BECAUSE THE INTERCOM WAS NOT WORKING. THE LIGHTS IN THE EXPOSURE AREA WENT OUT FOR TRANSFER TO ANOTHER POWER SOURCE. AN OFFICER ON AN INSPECTION TOUR PROCEEDED FROM ANOTHER DIRECTION IN A DARKENED PASSAGEWAY, FELT THE SIGN BUT COULDN'T TELL WHAT IT SAID, WENT UNDER THE ROPE BARRICADE, NOTICED THE EXPOSURE HEAD, TOUCHED IT AND WAS THEN OBSERVED BY THE RADIOGRAPHERS, WHO WARNED HIM OUT OF THE RADIATION AREA. DOSE WAS 5 REMS WHOLE-BODY, AND 350 TO FINGERTIPS OF LEFT HAND.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, EQUIPMENT + *PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR + *FAILURE, SEQUENTIAL

23362

CLIFFORD FL

RADIOGRAPHY OVEREXPOSURE AT BOSTON NAVAL SHIPYARDS, 11 DEC. 1967

BOSTON NAVAL SHIPYARD, BOSTON, MASS.

2 PAGES, ATOMIC ENERGY CLEARING HOUSE 14(9), PAGES 27-28 (FEBRUARY 26, 1968)

(LETTER, JAN. 9) THE RADIOGRAPHER IN CHARGE FAILED TO SURVEY THE RETURN OF THE SOURCE AFTER EACH EXPOSURE AND UPON COMPLETION OF THE WORK. HIS ASSISTANT WORE DOSIMETER AND FILM BADGE (800 MR, GAMMA), BUT THIS WAS THOUGHT THE LEAST EXPOSURE. A HELPER CARRIED THE COILED TUBE BACK TO THE STOREROOM. ***ANOTHER RADIOGRAPHER SURVEYED THE CONCRETE STORAGE ROOM, AND OBSERVED HIGH READINGS. ***RE-ENACTMENT LED TO ESTIMATE OF 2.2 REMS, 0.8 REM (AS INDICATED BY FILM BADGE), AND 4.2 TO 230 REMS FOR THE THIRD MAN. THE LATTER DOSE WOULD RESULT IF THE SOURCE IN THE COILED TUBE WERE AT MAXIMUM PROXIMITY TO THE BODY WHILE HAND-CARRIED. ***CORRECTIVE STEPS INCLUDE - ALL NOT LAB EMPLOYEES REQUIRED TO WEAR FILM BADGE, A CRITIQUE HELD FOR RADIOGRAPHERS, PLANS TO RE-EXAMINE RADIOGRAPHERS YEARLY, AND PROCUREMENT OF AUDIBLE MONITORING DEVICES.

FAILURE, OPERATOR ERROR + DOSE CALCULATION, EXTERNAL + *PERSONNEL EXPOSURE, RADIATION

65442
DEPT OF NAVY FOUND LEAKING SOURCE
COMMANDING OFFICER, BREMERTON, WASHINGTON
2 PAGES, LETTER FROM DEPARTMENT OF NAVY TO UNITED STATES ATOMIC ENERGY COMMISSION, MAY 18, 1971

A LEAK TEST ON A IR-192 SOURCE AS RECEIVED SHOWED .0123 MICROCURIE OF REMOVABLE CONTAMINATION.
SOURCE WAS RETURNED TO RENDOR.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*IRIDIUM + FAILURE, EQUIPMENT + *SOURCE, RADIATION + *LEAK

26331
OVEREXPOSURE TO RADIOGRAPHER
U.S. NAVY, CHARLESTON NAVAL SHIPYARD, CHARLESTON, S. C.
7 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM E.H. BATCHELLER, DECEMBER 17, 1964

ON 10 OCTOBER 1964, A SOURCE FAILED TO RETURN TO THE CAMERA. SUPERVISION WAS NOTIFIED AND RECOVERY ACCOMPLISHED BY SLIDING A 2-FT LENGTH OF LEAD PIPE UP OVER THE ROLL-OUT TUBE, CRIMPING THE ENDS, AND TRANSFERING THIS TO A SHIELD. ONE MONTH LATER, A ROUTINE BADGE REPORT SHOWED THAT THE RADIOGRAPHER INVOLVED HAD RECEIVED 6.2 REMS. INVESTIGATION REVEALED THAT HE HAD CONNECTED AND DISCONNECTED THE CONTROL CABLE WHILE THE SOURCE WAS STILL EXPOSED. HE HAD LOST HIS ORIGINAL POCKET DOSIMETERS AND FAILED TO REPORT IT, THUS NO INITIAL INDICATION OF OVEREXPOSURE. RETRAINING PROGRAMS WILL BE INTENSIFIED.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

FAILURE, EQUIPMENT + *PERSONNEL EXPOSURE, RADIATION + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR + *INCIDENT, RECOVERY FROM

40483
RADIATION EXPOSURE TO RADIOGRAPHER
DEPARTMENT OF THE NAVY (NAVAL SHIPYARD, CHARLESTON)
3 PAGES, TELEGRAM - NAVAL SHIPYARD, CHARLESTON, S.C., TO DIVISION OF COMPLIANCE - DECEMBER 4, 1969

RADIOGRAPHERS FILM BADGE FOR NOVEMBER 1969 SHOWED 10 REMS OF X-RAY EXPOSURE. HE WAS USING AN INDUSTRIAL X-RAY UNIT. POCKET DOSIMETERS SHOWED ONLY 0.129 REM FOR THE MONTH. INVESTIGATION TO BE MADE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*INCIDENT, EXPOSURE + INCIDENT + *PERSONNEL EXPOSURE, RADIATION + *X-RAY

26381
CLUSS RD
OVEREXPOSURE TO RADIOGRAPHER DURING STORAGE OF SOURCE
U.S. NAVY, MARE ISLAND SHIPYARD
3 PAGES, LETTER TO AEC DIVISION OF MATERIALS LICENSING FROM CHIEF OF BUREAU OF SHIPS, APRIL 14, 1965

ON MARCH 10, 1965, A RADIOGRAPHER RECEIVED AN ESTIMATED DOSE OF 46.6 REMS TO THE LEFT HAND AND 400 MREM WHOLE BODY. A PROJECTOR WITH SOURCE HAD BEEN DAMAGED WHEN A TRANSFER WAGON OVERTURNED. TWO BOLTS HOLDING THE CONTROL BOX TO THE PROJECTOR WERE BROKEN, AND UNKNOWN TO THE OPERATORS, THE THREADS OF THE REMAINING TWO BOLTS WERE STRIPPED. THE PROJECTOR WAS BEING RETURNED TO STORAGE, AND, WHILE SUSPENDED FROM A CRANE, THE WEIGHT OF THE CABLES CAUSED THE CONTROL BOX, PIGTAIL, AND SOURCE TO PULL FREE. THE RADIOGRAPHER PICKED UP THE PIGTAIL AND RETURNED THE SOURCE TO THE PROJECTOR.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

FAILURE, EQUIPMENT + *FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR

34867
LACK OF POSITIVE LOCK IN RADIOGRAPHY DEVICE CAUSES OVEREXPOSURE
U.S. DEPT. OF THE NAVY (NORFOLK NAVAL SHIPYARD)
2 PAGES, LETTER TO DL AND R, FEBRUARY 20, 1969

ON JANUARY 22, 1969, A RADIOGRAPHER AT THE NORFOLK, VIRGINIA, NAVAL SHIPYARD CHECKED HIS POCKET DOSIMETER, AFTER 6 EXPOSURES WITH A T.O. MODEL 576 USING A 96-CURIE CO-60 SOURCE, AND FOUND IT OFFSCALE. HIS FILM BADGE READ 4.22 REMS. INVESTIGATION REVEALED THIS MODEL, UNLIKE OTHERS, HAD NO POSITIVE LOCKING DEVICE. WHEN THE SOURCE WAS RETRACTED, IT WOULD CREEP OR SPRING OUT OF THE SHIELD UNLESS THE CRANK HANDLE WAS TIED. RADIATION LEVELS NEAR THE SOURCE TUBE END OF THE STORAGE DEVICE WOULD EXCEED 1 R/HR. THE DEVICE WAS RETURNED TO THE MANUFACTURER FOR INSTALLATION OF A LOCKING DEVICE, AND ALL RADIOGRAPHERS ISSUED PERSONAL RADIATION MONITORS WITH AUDIBLE ALARMS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (\$0.25 CENTS/PAGE)

34867 *CONTINUED*
 *INCIDENT, EXPOSURE + COBALT + *PERSONNEL EXPOSURE, RADIATION + *SHIELDING + SAFETY DEVICE

47192
 TWO RADIOGRAPHERS OVEREXPOSED
 DEPARTMENT OF THE NAVY, NORFOLK NAVAL SHIPYARD, VIRGINIA
 3 PAGES, LETTER - COMMANDER, NORFOLK SHIPYARD TO DIVISION OF COMPLIANCE (AEC) - SEPTEMBER 17, 1969

THE CAUSE OF THE OVEREXPOSURE OF THESE EMPLOYEES WERE MULTIFOLD. THE CONTROL CRANK HAD BEEN PLACED INSIDE THE INTERLOCK SO THAT THE ALARM SYSTEM WAS INOPERABLE. THE OPERATOR FAILED TO ASCERTAIN THAT THE EXPOSURE DEVICE WAS SURVEYED PRIOR TO ENTERING THE EXPOSURE AREA. NEITHER OPERATOR OR ASSISTANT WERE WEARING AUDIO-PERSONNEL MONITORS. THE TWO EMPLOYEES WERE FATIGUED BY HAVING WORKED AN EXCESSIVE AMOUNT OF OVERTIME DURING THE TWO WEEKS PRIOR TO THIS INCIDENT. THE RADIOGRAPHIC SITE HAS BEEN RESTRICTED FOR USE ONLY WITH THE PERMANENTLY INSTALLED X-RAY MACHINE THAT IS ELECTRICALLY CONNECTED TO THE SAFETY INTERLOCK THAT WILL SHUT OFF THE MACHINE WHEN ENTRANCE IS ATTEMPTED WHILE THE MACHINE IS IN OPERATION.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + *FAILURE, OPERATOR ERROR + IRIIDIUM

26383
 OVEREXPOSURE TO RADIOGRAPHERS
 U.S. NAVY, PHILADELPHIA NAVAL SHIPYARD
 2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM R.A. MOUNT, NOVEMBER 18, 1965

ON NOVEMBER 2, 1965, TWO RADIOGRAPHERS RECEIVED OVEREXPOSURES OF 2.5 AND 3.5 REMS WHEN THEY TRIED TO RETURN THE SOURCE TO THE SHIELD. THEY HAD SUPPOSEDLY CONNECTED THE SOURCE CABLE TO THE DRIVE CABLE.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR

26330
 OVEREXPOSURE TO SUPERVISORS DURING RECOVERY OF EXPOSED SOURCE
 U.S. NAVY, PORTSMOUTH NAVAL SHIPYARD, PORTSMOUTH, NEW HAMPSHIRE
 3 PAGES, LETTER TO DIVISION OF MATERIALS LICENSING FROM W.C. HUSHING, FEBRUARY 10, 1965

AT 3 AM ON JANUARY 13, 1965, A RADIOGRAPHER NOTIFIED HIS SUPERVISOR OF DIFFICULTIES IN RETRACTING A 108-CURIE SOURCE. THE SUPERVISOR AND ASSOCIATE SUPERVISOR RECEIVED OVEREXPOSURES RETURNING THE SOURCE TO THE PROJECTOR (FAILED TO SURVEY THE AREA PROPERLY). ALSO, THE SUPERVISOR TOOK OFF HIS JACKET CONTAINING HIS FILM BADGE DURING THE OPERATION. DOSES WERE 3 AND 3.124 REMS. HAND EXPOSURE WAS ESTIMATED AT 6 REMS. CAUSE OF INCIDENT - RADIOGRAPHER FAILED TO CONNECT THE SOURCE TUBE TO THE PROJECTOR.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION + INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR + INCIDENT, RECOVERY FROM + *FAILURE, ADMINISTRATIVE CONTROL

26340
 RADIATION EXPOSURE TO EXPERIENCED RADIOGRAPHERS
 U.S. NAVY, PUGET SOUND NAVAL SHIPYARD, BREMERTON, WASHINGTON
 4 PAGES, MEMORANDUM OF RADIATION EXPOSURE INCIDENT, SEPTEMBER 6, 1967

RADIOGRAPHER B, WITH 5 YEARS EXPERIENCE, ASSUMED THAT SOURCE HAD BEEN RETRACTED WHEN CRANKING BECAME DIFFICULT. ACTUALLY, MORE EFFORT WAS NEEDED ON LAST TURN TO RETRACT SOURCE AROUND AN S CURVE IN SHIELD. RADIOGRAPHER A, WITH 10 YEARS EXPERIENCE, SURVEYED FROM RFAR AND OBTAINED NORMAL READINGS SINCE SOURCE WAS SHIELDED BY CAMERA. NEITHER OBSERVED THAT STORAGE LIGHT WAS NOT INDICATING THAT SOURCE HAD BEEN RETRACTED. RADIOGRAPHER A RECEIVED A DOSE OF 3500 MR, AND B 290 MR.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, OPERATOR ERROR + *PERSONNEL EXPOSURE, RADIATION + INCIDENT, NONREACTOR

29856
 RADIOGRAPHY SOURCE FOUND CONTAMINATED ON RECEIPT
 DEPARTMENT OF THE NAVY, PUGET SOUND
 2 PAGES, LETTER TO DIVISION OF MATERIALS LICENSING, OCTOBER 23, 1968

ON OCT. 18, 68, A GAMMA INDUSTRIES S-17 29 CURIE IR-192 RADIOGRAPHY SOURCE WAS RECEIVED. LEAK TEST CONDUCTED BEFORE RECEIPT SHOWED 0.017 MICROCURIE REMOVABLE IR-192 CONTAMINATION. THE SHIPPING CONTAINER SHOWED NO EXTERNAL CONTAMINATION THOUGH A WIPE OF THE STORAGE WELL SHOWED 0.95 MICROCURIE OF IR-192. ***SOURCE IS BEING RETURNED. BECAUSE THIS IS THE 3RD SUCH INCIDENT IN

29856 *CONTINUED*

1968, VENDOR IS REQUESTED TO REVIEW HIS SOURCE DECONTAMINATION AND WIPE TESTING PROGRAM.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (\$0.25 CENTS/PAGE)

*SOURCE, RADIATION + *CONTAMINATION + IRIIDIUM

57398

LEAK IN SR-90 SOURCE FOUND BY SAN FRANCISCO BAY NAVAL SHIPYARD

SAN FRANCISCO BAY NAVAL SHIPYARD

1 PAGE, LETTER - SAN FRANCISCO BAY NAVAL SHIPYARD TO DIVISION OF COMPLIANCE (AEC) - SEPTEMBER 25, 1970

A LEAK RATE GREATER THAN 0.005 MICROCURIE WAS DETECTED BY WIPE TEST ON A 100-MICROCURIE SR-90 SOURCE IN A RADIAC INSTRUMENT. THE INSTRUMENT WAS PLACED IN A DOUBLE PLASTIC BAG, SEALED, AND STORED IN A SECURE AREA PENDING DISPOSAL.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

FAILURE, EQUIPMENT + *SOURCE, RADIATION + *LEAK

55281

LEAK IN SOURCE AT SAN FRANCISCO BAY NAVAL SHIPYARD

SAN FRANCISCO BAY NAVAL SHIPYARD, CALIFORNIA

2 PAGES, LETTER - SAN FRANCISCO BAY NAVAL SHIPYARD TO DIVISION OF COMPLIANCE (AEC) - OCTOBER 19, 1970

A LEAK WAS FOUND IN A SOURCE. FOUND 0.079 MICROCURIE OF REMOVABLE CONTAMINATION. FAILURE PROBABLY CAUSED BY FRICTION BETWEEN SOURCE AND SHUTTER.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

FAILURE, EQUIPMENT + *SOURCE, RADIATION + *LEAK

26327

RADIOGRAPHER NEGLECT RESULTS IN 3.5 R DCSE

NAVAL RADIOLOGICAL DEFENSE LAB, SAN FRANCISCO, CALIFORNIA

2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM D.C. CAMPBELL, JUNE 16, 1964

ON APRIL 21, 1964, DURING ROUTINE EXPOSURE RUNS, A 2500-CURIE CO-60 SOURCE FAILED TO RETURN TO ITS SHIELD BECAUSE OF A MECHANICAL OBSTRUCTION. THE WARNING DEVICES FUNCTIONED PROPERLY BUT THE RADIOGRAPHERS FAILED TO TAKE NOTE AND FAILED TO SURVEY. EXPERIMENTER WORKING WITH RADIOGRAPHER ENTERED AREA AND APPROACHED THE SOURCE BEFORE HE NOTICED THAT IT WAS EXPOSED. DOSE RECEIVED, 3.5 R. OPERATOR RETRAINING WILL OCCUR EVERY 6 MONTHS.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

FAILURE, EQUIPMENT + *FAILURE, OPERATOR ERROR + SOURCE, RADIATION + TRAINING + *PERSONNEL EXPOSURE, RADIATION

10869

IR-192 SOURCE FAILS TO RETRACT INTO EXPOSURE DEVICE (RADIOGRAPHY)

USS PROTEUS

2 PAGES, LETTER - USS PROTEUS TO DIVISION OF COMPLIANCE (AEC) - AUGUST 5, 1968

UPON THE COMPLETION OF THE FOURTH EXPOSURE, THE SOURCE FAILED TO RETRACT INTO THE EXPOSURE DEVICE. INVESTIGATION REVEALED THAT THE SOURCE-DRIVE CABLE BECAME DISCONNECTED FROM THE SOURCE WHILE EXTENDED IN THE COLLIMATOR. RADIATION SURVEYS INDICATED THAT THE IR-192 SOURCE WAS LOCATED WITHIN THE RADIOGRAPHIC COLLIMATOR. ADDITIONAL LEAD SHIELDING WAS PLACED AROUND THE COLLIMATOR. THE SOURCE DRIVE CABLE WAS DISCONNECTED FROM THE COLLIMATOR, A SECOND DRIVE CABLE WAS ATTACHED TO THE SOURCE AND RETRACTED INTO THE EXPOSURE DEVICE. INVESTIGATION REVEALED THAT THE DRIVE-CABLE CONNECTOR HOOK (PART NO. 200-032007) HAD SPREAD OPEN, PERMITTING THE SOURCE AND DRIVE-CABLE CONNECTORS TO DISENGAGE. FURTHER INVESTIGATION REVEALED THAT THE DRIVE CABLE CONNECTOR HAD BEEN PREVIOUSLY REPAIR WELDED BY PERSONS UNKNOWN TO THIS COMMAND. THE DEFECTIVE CABLE HAS BEEN PERMANENTLY REMOVED FROM SERVICE. RADIOGRAPHIC PERSONNEL HAVE BEEN INSTRUCTED NOT TO REPAIR EQUIPMENT NOR MAKE REPAIRS ON ANY RADIOLOGICAL EQUIPMENT WITHOUT AUTHORIZATION.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*FAILURE, EQUIPMENT + *IRIDIUM

26310

U.S. TESTING CO. CITED FOR NON-COMPLIANCE IN RADIOGRAPHY OPERATIONS

UNITED STATES ATOMIC ENERGY COMMISSION

4 PAGES, LETTER TO U.S. TESTING CO. FROM E.R. PRICE, NOVEMBER 10, 1965

NONCOMPLIANCE ITEMS INCLUDE PERSONNEL FAILING TO WEAR DOSIMETERS AND BADGES, INADEQUATE PERSONNEL

26310 *CONTINUED*

MONITORING RECORDS, PERFORMING RADIOGRAPHY WITHOUT OPERABLE SURVEY INSTRUMENTS, UNQUALIFIED PERSONNEL ACTING AS RADIOGRAPHERS, ASSISTANTS HAD NOT RECEIVED COPIES OF OPERATING AND EMERGENCY PROCEDURES, SURVEILLANCE INADEQUATE TO PREVENT UNAUTHORIZED ENTRY INTO HIGH RADIATION AREAS, SURVEY INSTRUMENTS WERE NOT CALIBRATED EVERY 3 MONTHS, IMPROPER UTILIZATION LOGS, AND COMPANY FAILURE TO REPORT AN EMPLOYEE OVEREXPOSURE.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, OPERATOR ERROR + *FAILURE, ADMINISTRATIVE CONTROL

26384

RESPONSE TO AEC CITATION FOR NONCOMPLIANCE IN RADIOGRAPHY OPERATIONS
UNITED STATES TESTING COMPANY, HOBOKEN, N. J.

5 PAGES, LETTER TO AEC DIVISION OF STATE AND LICENSE RELATIONS FROM A. L. BRASSELL, NOVEMBER 26, 1965

PERSONNEL CHANGES RESULTED IN RELAXATION OF EMPLOYEE TRAINING. SHORTAGES OF DOSIMETERS RECTIFIED BY PURCHASE OF OTHERS, FILM BADGES NOW ASSIGNED TO PERSONNEL, RECORD-KEEPING SYSTEM WAS REVISED, MONTHLY EQUIPMENT INVENTORY STARTED TO ENSURE THAT PERSONNEL WILL HAVE SURVEY METERS AND THAT REGULAR CALIBRATION IS PERFORMED. RETRAINING PROGRAM GIVEN TO ALL RADIOGRAPHERS AND ASSISTANTS. ALL WORKERS WERE ISSUED COPIES OF EMERGENCY PROCEDURES, RADIATION SAFETY OFFICER NOW REVIEWS DAILY THE UTILIZATION LOG.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

*FAILURE, OPERATOR ERROR + *FAILURE, ADMINISTRATIVE CONTROL

26388

FAILURE TO SURVEY RESULTS IN OVEREXPOSURE TO RADIOGRAPHER

VESTER J. THOMPSON, JR., INC., MOBILE, ALABAMA

2 PAGES, LETTER TO AEC DIVISION OF LICENSING AND REGULATION FROM V. J. THOMPSON, JR., JULY 1, 1965

RADIOGRAPHER RECEIVED A QUARTERLY DOSE OF 1820 MR, OF WHICH 1050 WAS RECEIVED IN ONE EXPOSURE AS A RESULT OF FAILING TO SURVEY TO ENSURE THE RETURN OF A SOURCE TO A SAFE POSITION. THE OVEREXPOSURE AND CAUSE WERE DISCUSSED WITH ALL THE EMPLOYEES, AND THE RADIOGRAPHER WAS RELIEVED OF HIS DUTIES.

USAEC, PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

SOURCE, RADIATION + *PERSONNEL EXPOSURE, RADIATION + *INCIDENT, HUMAN ERROR + INCIDENT, NONREACTOR

63795

STORAGE OF BYPRODUCT MATERIAL

U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D.C.

LETTER FROM DIVISION OF COMPLIANCE TO VICTOREEN INSTRUMENT DIVISION +. 4 PAGES, APRIL 8, 1971

AS THE RESULT OF AN INSPECTION FEB. 17, 1971, THE CABINET USED FOR STORING BY-PRODUCT MATERIAL WILL BE LOCATED WITHIN A 10-FOOT-SQUARE ROOM MADE OF WIRE MESH. THE DOOR WILL BE KEPT LOCKED AND THE AREA MARKED. THE RADIATION AT THE FENCE WILL BE LESS THAN 2 MILLIREMS PER HOUR. RADIATION OUTSIDE THE STOCKROOM WILL BE MONITORED AND KEPT BELOW 0.5 MILLIREM PER HOUR.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*FAILURE, ADMINISTRATIVE CONTROL + RADIATION SAFETY AND CONTROL

16370

SHIFLOS RR

RADIOGRAPHY SOURCE CAPSULE SEPARATES AT WALWORTH PRODUCT DIVISION, GREENBURG PA. MARCH 21, 1967

WALWORTH CO., GREENBURG, PA.

2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(24) PAGES 17-18 (JUNE 12, 1967)

(LETTER, MARCH 22). AFTER AN EXPOSURE, THE SURVEY SHOWED RADIATION LEVELS ABOVE NORMAL IN THE AREA OF THE PROJECTOR. OPERATOR REPORTED TO SUPERVISOR, WHO FOUND 15 MR/HR IN EXPOSURE AREA, AND HIGHER LEVELS AT PROJECTOR-AREA ENTRANCE. REPEATED CONTROL ACTUATION REDUCED RADIATION IN THE EXPOSURE AREA TO NORMAL. ON EXAMINING THE SOURCE SWITCH, A SMALL OBJECT (RESEMBLING THE DUMMY SOURCE CAPSULE, GREATER THAN 50 MR/HR AT CONTACT) FELL OUT. THE MANUFACTURER WAS CALLED, WHO ARRANGED FOR IMMEDIATE HELP AND THEN CAME HIMSELF. A DETAILED REPORT WILL BE SUBMITTED LATER. THE SMALL OBJECT WAS THE NCSE PIECE OF THE CAPSULE. PELLETS WERE IN PROJECTOR. NO CONTAMINATION WAS FOUND. OPERATING PERSONNEL RECEIVED 30 MR.

FAILURE, EQUIPMENT + SOURCE, RADIATION + *INCIDENT, EQUIPMENT

56047

POSSIBLE EXCESSIVE GAMMA EXPOSURE

WALWORTH COMPANY, GREENSBURG, PENNSYLVANIA

6 PAGES, LETTER - WALWORTH COMPANY TO DIVISION OF COMPLIANCE (AEC) - SEPTEMBER 4, 1970

56047 *CONTINUED*

A FILM BADGE INDICATED 3.2 REMS EXPOSURE TO WORKER FOR ONE WEEK. EMPLOYEE STATES HE MAY HAVE LEFT BADGE ON SHIRT, WHICH HE REMOVED DURING PART OF HIS WORK TIME. HIS DOSIMETER DID NOT INDICATE A HIGH EXPOSURE. HE WAS ASSIGNED TO OTHER DUTIES WHERE HE WOULD NOT BE EXPOSED TO RADIATION. ALL WORKERS WERE INSTRUCTED TO WEAR BADGES ON FRONT OF BODY, ATTACHED TO BELT OR BELT LOOP.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*PERSONNEL EXPOSURE, RADIATION + *FAILURE, OPERATOR ERROR + SOURCE, RADIATION + MONITOR, PERSONNEL

63682

THIRTEEN WORKERS OVEREXPOSED DURING FIRST TWO QUARTERS OF 1970 (RADIOGRAPHY)

WALWORTH COMPANY

26 PAGES, LETTER TO DIVISION OF COMPLIANCE FROM WALWORTH CO., SOUTH GREENSBURG, PA 15601, APRIL 15, 1971

LETTER TO DIV. OF COMPLIANCE WAS ACCOMPANIED BY COMPANY NOTICES (STANDARD FORMS) TO EMPLOYEES WHO HAD RECEIVED THE OVEREXPOSURES, MOSTLY FROM CO-60 AND IR-192. ALSO INCLUDES SOME DESCRIPTIONS OF THE INCIDENTS (ACCOUNTS BY EMPLOYEES).

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

COBALT + *PERSONNEL EXPOSURE, RADIATION + *IRIDIUM + SOURCE, RADIATION

10621

RADIOGRAPHIC COMPANY CITED FOR TWENTY VIOLATIONS

U.S. ATOMIC ENERGY COMMISSION, DIVISION OF COMPLIANCE

4 PAGES, LETTER - DIVISION OF COMPLIANCE (AEC) TO WARNOCK HERSEY INTERNATIONAL LIMITED - SEPTEMBER 4, 1968

SURVEYS WERE NOT, IN ALL CASES, CONDUCTED TO DETERMINE COMPLIANCE WITH 10 CFR 20 WITH RESPECT TO THE QUANTITIES OF RADIATION EXISTING OUTSIDE THE VEHICLES USED TO TRANSPORT BYPRODUCT MATERIAL SEALED SOURCES. THE HIGH RADIATION AREAS EXISTING AT RADIOGRAPHY SITES IN MINNESOTA AND WISCONSIN WERE NOT POSTED. PERSONNEL MONITORING RECORDS WERE NOT MAINTAINED ON FORM AEC-5 OR ITS EQUIVALENT.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*FAILURE, ADMINISTRATIVE CONTROL

32427

NONCOMPLIANCE CITATION FOR RADIOGRAPHY

U.S. ATOMIC ENERGY COMMISSION

5 PAGES, LETTER TO B. KERR, WARNOCK HERSEY INTERNATIONAL, LTD., JANUARY 27, 1969

13 SPECIFIC ITEMS, MOSTLY ABOUT NOT KEEPING RECORDS OF RADIATION SURVEYS, DOSIMETER READINGS, OR FILM-BADGE REPORTS. PERSONS WERE ALLOWED TO RADIOGRAPH WITHOUT A LICENSE OR INSTRUCTIONS IN LICENSE PROVISIONS. INSPECTOR FOUND RADIOGRAPHERS DOSIMETER OFF SCALE FOR 2 OR 3 WEEKS. *** RECURRENT NATURE OF VIOLATIONS INDICATES INADEQUATE MANAGEMENT CONTROL. (OCT. 18, 1968, REPLY TO CRYPT. 4 CITATION) - STATES CORRECTIVE ACTIONS TO 20 SPECIFIC ITEMS, MOSTLY CONCERNING RECORDS OF RADIATION SURVEYS, DOSIMETER READINGS, OR UTILIZATION.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON D.C. 20545 (\$0.25 CENTS/PAGE)

CANADA + *FAILURE, OPERATOR ERROR + PERSONNEL PROTECTIVE DEVICE + TRAINING + SURVEY, RADIATION + RADIATION SAFETY AND CONTROL + *FAILURE, ADMINISTRATIVE CONTROL

35472

RESPONSE TO NONCOMPLIANCE CITATION

WARNOCK HERSEY INTERNATIONAL, LTD.

2 PAGES, LETTER TO L.D. LOW, DIVISION OF COMPLIANCE, FEBRUARY 12, 1969

RESPONSE TO SEPTEMBER 1968 INSPECTION AND CITATION OF JANUARY 27, 1969 - (A) RADIOGRAPHERS WORKING IN U.S. WILL COMPLETE INDUSTRIAL RADIOGRAPHY COURSE DEVELOPED BY USAEC. (B) USAEC WILL BE CONTACTED PRIOR TO FURTHER U.S. OPERATIONS. (C) U.S. OFFICE WILL BE ESTABLISHED FOR RECORDS. (D) FILM BADGES WILL BE PROCESSED BY U.S. FIRM FOR RECORD KEEPING. *** ANSWERS TO SELECTED QUESTIONS - (1) TIME LAPSE BETWEEN CRYSTAL FALLS RADIOGRAPHERS EXAMINATION, RESULTS AND LICENSE AMENDMENT WAS SIX WEEKS. (2) RADIOGRAPHER AT ST. VINCENT, MINN., WAS LAX WITH RECORDS BUT SUBMITTED DOSIMETER RECORDS TO MONTREAL. SURVEYS WERE MADE BUT RECORD NOT KEPT. (3) DAILY LOG ENTRIES OF EXPOSURE DEVICE WAS NOT MADE BECAUSE EQUIPMENT REMAINED UNCHANGED. (4) OPERATORS AT ST. VINCENT AND DEER RIVER DID NOT HAVE RECENTLY AMENDED USAEC LICENSE DUE TO MAILING TIME LAG. (5) ST. VINCENT OPERATION HAD DOSIMETER CHARGER TROUBLE, REPLACEMENT WAS SENT IMMEDIATELY.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

CANADA + LICENSE STATUS + *RADIATION SAFETY AND CONTROL + *FAILURE, ADMINISTRATIVE CONTROL + OPERATING LICENSE PROCESS + *RADIATION EXPOSURE, RECORD KEEPING + *STAFFING

35473
 POTENTIAL RELICENSING DENIAL BECAUSE OF NONCOMPLIANCE
 U.S. ATOMIC ENERGY COMMISSION
 2 PAGES, LETTER TO BYRON KERR, WARNOCK HERSEY INTERNATIONAL, LTD., APRIL 2, 1969

LETTER OF FEB. 12, 1969, IS UNSATISFACTORY RESPONSE TO FOLLOWING 4 OF 13 ITEMS CITED (AEC LETTER JAN. 27, 1969, REGARDING SEPT. 1968 INSPECTION) AND UNLESS AMENDED WILL RESULT IN RELICENSING DENIAL (LICENSE EXPIRED JAN. 31, 1969). ITEMS - (1) COMPANY DOES NOT SPECIFY CORRECTIVE ACTION TAKEN TO ENSURE FUTURE COMPLIANCE. (6) NO ASSURANCE LOGS WILL BE MAINTAINED. (7) REPLY FAILED TO ACKNOWLEDGE DEFICIENCY DESCRIBED. (8) NO ASSURANCE THAT RADIOGRAPHY WILL NOT BE PERMITTED WITHOUT DOSIMETRY CAPABLE OF 0 TO 200 MR. *** DISCREPANCY BETWEEN DOSIMETER AND SURVEY RECORDS IS NOT EXPLAINED AND NO STEPS TO STRENGTHEN RADIATION SAFETY OUTLINED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE)

CANADA + *LICENSE STATUS + *RADIATION SAFETY AND CONTROL + *FAILURE, ADMINISTRATIVE CONTROL + OPERATING LICENSE PROCESS + *RADIATION EXPOSURE, RECORD KEEPING + *STAFFING

61441
 EXTERNAL CONTAMINATION FOUND ON TWO SOURCES AT WESTERN RESERVE UNIVERSITY
 WESTERN RESERVE UNIVERSITY, CLEVELAND, OHIO
 2 PAGES, LETTER - WESTERN RESERVE UNIVERSITY TO DIVISION OF MATERIALS LICENSING (AEC) - JANUARY 22, 1971

INITIAL LEAK TEST OF A CO-57 SOURCE SHOWED EXTERNAL CONTAMINATION. NO CRACK OR APPARENT LEAK WAS FOUND. SOURCE WAS DECONTAMINATED. A SECOND LEAK TEST WAS SATISFACTORY. A PM-147 SOURCE HAD CONTAMINATION ON THE COVER. SOURCE WAS SEALED IN ITS STORAGE CONTAINER AND PUT OUT OF SERVICE AWAITING DISPOSAL.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

COLLEGES AND UNIVERSITIES + *SOURCE, RADIATION + LEAK

16761
 INCIDENTS DURING 1964 SHIPPINGPORT MODIFICATION
 WESTINGHOUSE ELECTRIC CORP., BETTIS ATOMIC POWER LAB., PITTSBURGH
 WAPD-298 +. 2 PAGES, PAGE 21 AND 43 OF RADIOLOGICAL CONTROL. SHIPPINGPORT PWR CORE 1, CORE 2 REPLACEMENT AND THE PWR CORE 2 MODIFICATION PROGRAM, MARCH, 1967

(PAGE 21) - SEVERAL INCIDENTS INVOLVED UNNECESSARY RADIATION EXPOSURE TO RADIOGRAPHERS WORKING ON PIPE WELDING. IN EACH INSTANCE, THE INCIDENT WAS THE DIRECT RESULT OF CARELESSNESS OR NEGLIGENCE BY THE RADIOGRAPHER OR FAILURE TO FOLLOW THE OPERATING PROCEDURES. (PAGE 43) - A PIPEFITTER REMOVED A PLUG AND GROUND THE HOLE. A 12-IN. BLUE FLAME FLASHED OUT. THE FITTER CONTINUED WORK AND AT SHIFT CHANGE WAS CONTAMINATED (4 MREM/HR). PROCEDURE NOW REQUIRES USE OF A PIPE CUTTER, EXPLOSMETER, AND NITROGEN PURGE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, \$3.00 COPY, \$0.65 MICROFICHE

FAILURE, OPERATOR ERROR + *MAINTENANCE AND REPAIR + REACTOR, PWR + SHIPPINGPORT (PWR) + WELDING + *PERSONNEL EXPOSURE, RADIATION + *RADIATION SAFETY AND CONTROL

57040
 CESIUM SOURCE LOST BY WESTINGHOUSE
 WESTINGHOUSE ELECTRIC CORPORATION
 1 PAGE, TWX - WESTINGHOUSE TO DIVISION OF COMPLIANCE (AEC) - SEPTEMBER 9, 1970

A SEALED 9.4-MILLICURIE CS-137 SOURCE REPORTED MISSING. USED AUGUST 29 FOR CALIBRATION OF GAMMA ALARMS. CHECK MADE OF PEOPLE HAVING ACCESS TO THE SOURCE. SURVEYED AREA WHERE IT WAS LAST USED, STORED, AND THE ROUTE OVER WHICH IT WAS MOVED. FOUND MISSING ON SEPT. 21, 1970, WHEN SCHEDULED FOR ADDITIONAL CALIBRATION WORK.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D.C. 20545 (25 CENTS/PAGE, \$1.00-MIN. CHARGE)

*CESIUM + *FAILURE, ADMINISTRATIVE CONTROL + *SOURCE, RADIATION, LOST

30044
 ACTION TAKEN ON COMPLIANCE CITATION SEPT 25, 1968
 X-RAY ENGINEERING CORPORATION, SAN MATEO, CALIFORNIA
 7 PAGES, LETTERS TO USAEC DIVISION OF COMPLIANCE, OCTOBER 11, 1968, OCTOBER 14, 1968, NOVEMBER 6, 1968

(OCT. 11, 14, AND NOV. 6, 1968). INSPECTION AT HUNTERS POINT SHIPYARD ON THE GRAVEYARD SHIFT PLUS LAZINESS CONTRIBUTED TO MAJORITY OF ITEMS. RADIOGRAPHERS HAVE BEEN SEVERELY REPRIMANDED. SIX MANAGEMENT PERSONNEL MUST MAKE UNANNOUNCED FIELD INSPECTIONS ON EACH RADIOGRAPHER AT LEAST ONCE A MONTH. RADIOGRAPHERS HAVE AGAIN BEEN INSTRUCTED TO USE COLLIMATORS, TO USE ROPES AND SIGNS. COMMUNICATION ON BLIND OPERATIONS WILL BE TAKEN CARE OF WITH ISSUANCE OF AUDIBLE POCKET RADIATION DETECTORS TO BE WORN BY RADIOGRAPHERS AND BY AN ADDITIONAL SURVEY INSTRUMENT USED ON THE BLIND

30044 . *CONTINUED*
SIDE OF THE SUBJECT.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, 1717 H ST., WASHINGTON, D. C. 20545 (\$0.25 CENTS/PAGE)

ADMINISTRATIVE CONTROL + FAILURE, OPERATOR ERROR + PERSONNEL PROTECTIVE DEVICE + *INCIDENT, HUMAN ERROR +
REMOTE MANIPULATING AND VIEWING

II - MISCELLANEOUS REFERENCES

61955
 CONDITIONS APPLICABLE TO INDUSTRIAL RADIOGRAPHY
 ATOMIC ENERGY CONTROL BOARD, CANADA
 AECB-1000 +. 5 PAGES, 1969

CANADIAN REGULATIONS FOR HANDLING RADIOGRAPHIC SOURCES (INDUSTRIAL), MARKING AND LABELING THEM,
 QUALIFICATIONS OF RADIOGRAPHERS, MEDICAL REQUIREMENTS, MONITORING, RECORD KEEPING, ETC.

AVAILABILITY - ATOMIC ENERGY CONTROL BOARD, P. O. BOX 1046, OTTAWA, CANADA

*REGULATION + *CANADA

65868
 GRUBER WJ
 AUTORADIOGRAPHY OF IRRADIATED NUCLEAR CERAMIC FUELS
 BATTTELLE MEMORIAL INSTITUTE, RICHLAND, WASHINGTON, USA
 5 PAGES, PROCEEDINGS OF 17TH CONFERENCE ON REMOTE SYSTEMS TECHNOLOGY, SAN FRANCISCO, CALIFORNIA, PAGE 21-5,
 NOVEMBER 1969

AUTORADIOGRAPHS OF NUCLEAR CERAMIC FUEL CROSS SECTIONS ARE MADE ROUTINELY TO COMPLEMENT
 CERAMOGRAPHY DURING POSTIRRADIATION EXAMINATION. AUTORADIOGRAPHS SHOW PLUTONIUM DISTRIBUTION IN
 PLUTONIUM-BEARING FUELS AND FISSION PRODUCT DISTRIBUTION IN ALL TYPES OF FUELS. BETA AND GAMMA
 RADIATION FROM FISSION PRODUCTS ARE RECORDED ON PHOTOGRAPHIC EMULSION BY DIRECT CONTACT OF SAMPLE
 AND FILM. ALPHA RADIATION IS SIMILARLY RECORDED, EXCEPT THE FILM IS CELLULOSE NITRATE DEVELOPED
 BY ETCHING IN SODIUM HYDROXIDE SOLUTION.

*FUEL ELEMENT + IRRADIATION TESTING + CERAMICS

43067
 GRUBER WJ
 AUTORADIOGRAPHY OF IRRADIATED NUCLEAR CERAMIC FUEL
 BATTTELLE-NORTHWEST LABORATORY
 2 PAGES, 2 REFERENCES, ANS TRANSACTIONS, 12(2), PG 842-843 (DECEMBER 1969)

BOTH PLUTONIUM AND FISSION PRODUCT AUTORADIOGRAPHS ARE RECORDED BY SAME METHOD. RECORDING MEDIA
 ARE PLACED IN CONTACT WITH PREPARED SURFACES OF CERAMIC FUEL CROSS SECTIONS TO FORM AN IMAGE.
 SAMPLE IS CAREFULLY PLACED WITH PREPARED SURFACE HELD AGAINST THE FILM DURING EXPOSURE PERIOD.
 PLIABLE FILM BASE AND NEOPRENE BACKING PERMITS FILM TO CONFORM TO THE SAMPLE SURFACE. EXPOSURE
 TIMES 5 TO 120 SEC. FILM FOR F.P. DEVELOPED THROUGH NORMAL TECHNIQUES. ALPHA AUTORADIOGRAPHS
 REQUIRE DIFFERENT TECHNIQUE.

AVAILABILITY - W. J. GRUBER, BATTTELLE MEMORIAL INSTITUTE, PACIFIC NORTHWEST LABORATORY, P.O. BOX 999,
 RICHLAND, WASHINGTON 99352

*CERAMICS + ALPHA EMITTER + *PLUTONIUM + *FISSION PRODUCT ACTIVITY, GROSS + *DOSIMETRY, PHOTOGRAPHIC + *REMOTE
 MANIPULATING AND VIEWING

16197
 SAFETY MANUAL - FOR USE OF OPERATORS DEALING WITH RADIOGRAPHY AND INDUSTRIAL GAMMAGRAPHY
 CENTRE D ETUDES DE PROTECTION, PARIS, FRANCE
 32 PAGES, FIGURES, SAFETY MANUAL, 1965

GIVES READABLE INFORMATION TOGETHER WITH AMUSING SKETCHES ON DANGERS, INDIVIDUAL DOSIMETRY,
 MEASURING DEVICES, DIRECT AND SCATTERED RADIATION, SUPERVISED ZONE, PROTECTION THROUGH DISTANCE
 OR SHIELDING, CAUTIONS DURING PICTURE TAKING OR IN CASE OF DIFFICULTY, AND MEDICAL VISITS.
 APPENDICES INDICATE SHIELDING EFFECTIVENESS, HALF-LIVES, ALLOWABLE DOSE RATES, AND METHODS FOR
 MAKING PROTECTION CALCULATIONS.

AVAILABILITY - USAEC DIVISION OF TECHNICAL INFORMATION EXTENSION, P.O. BOX 62, OAK RIDGE, TENNESSEE 37830

HEALTH PHYSICS TRAINING + *PROCEDURES AND MANUALS + *TRAINING + *RADIATION SAFETY AND CONTROL + *SAFETY
 PRINCIPLES AND PHILOSOPHY

18006
 DASGUPTA AK
 RADIATION SAFETY REQUIREMENTS FOR INDUSTRIAL RADIOGRAPHY USING RADIOISOTOPES
 RADIATION PROTECTION DIVISION, DEPT. OF NATIONAL HEALTH AND WELFARE, CANADA
 RPD-29 +. 11 PAGES, SEPTEMBER 1962

IN 1959, OVER 10,000 PERSONS USED THE RADIATION-MONITORING SERVICE, AND THE 13% IN INDUSTRY
 RECEIVED 31.7 OF THE TOTAL DOSE, WITH THE MAJOR CONTRIBUTION BEING DUE TO RADIOGRAPHY. IN THE
 YEAR ENDING MARCH 31, 1961, 11 OF THE RECORDED 18 INCIDENTS WERE FROM RADIOGRAPHY. BASIC CAUSES
 OF THESE INCIDENTS LISTED (DEFECTIVE SHIELDS, SOURCE-CABLE COUPLING, PROCEDURES) AND MINIMUM
 CONDITIONS FOR SAFE OPERATION DESCRIBED (SUPERVISION, TRAINING, DESIGN AND MAINTENANCE, AND
 PROCEDURES).

CANADA + MAINTENANCE AND REPAIR + INCIDENT COMPILATION + PROCEDURES AND MANUALS + TRAINING + *INCIDENT +
 *SAFETY PRINCIPLES AND PHILOSOPHY + FAILURE, ADMINISTRATIVE CONTROL

17445
BIRD PM
RADIATION ACCIDENTS - CAUSE AND EFFECT
DEPARTMENT OF NATIONAL HEALTH AND WELFARE, OTTAWA, ONTARIO
6 PAGES, 6 TABLES, 2 REFERENCES, CANADIAN JOURNAL OF PUBLIC HEALTH PAGES 7-12 (JAN. 1967)

A STUDY OF CANADIAN NONGOVERNMENTAL FILM-MONITORING RECORDS FOR 3 YEARS (58-60) WAS MADE OF ALL FILM DOSES ABOVE 600 MR. SEALED SOURCES ACCOUNTED FOR 107, AND UNSEALED SOURCES FOR THE OTHER 9. THE RECORDS WERE STUDIED, AND ABOUT 1/3 TO 1/5TH JUDGED UNAVOIDABLE. RADIOGRAPHY (42) AND X-RAYS (33) CONTRIBUTED THE BULK OF THE INCIDENTS, WITH ABOUT 6,282,887 R ANNUAL DOSE ACCUMULATED IN 417,351 FILM BADGES IN THOSE THREE YEARS. ARTICLE DISCUSSES METHOD OF DETECTION, INTERNAL AND EXTERNAL EXPOSURES, AND SPECIAL MEDICAL SUPERVISION.

CANADA + *INCIDENT + *PERSONNEL EXPOSURE, RADIATION + X-RAY

18008
GOSH SK + DASGUPTA AK
ASSESSMENT OF HAZARDS IN INDUSTRIAL RADIOGRAPHY USING PERSONNEL EXPOSURE DATA
RADIATION PROTECTION DIVISION, DEPT. OF NATIONAL HEALTH AND WELFARE, CANADA
RPD-33 +. 13 PAGES, 2 FIGURES, 7 TABLES, NOVEMBER 1963

OF THE 33 INCIDENTS IN 1962 THAT CAUSED DOSES OF MORE THAN 600 MR, 31 INVOLVED RADIOGRAPHIC DEVICES THAT PROJECTED THE SOURCE OUT OF THE SHIELD ALONG A GUIDE TUBE. INVESTIGATION SHOWED MOST OF THE INCIDENTS COULD HAVE BEEN AVOIDED. VARIOUS DOSE DATA IS ANALYZED, AND CONCLUSION REACHED THAT SOURCE STRENGTH SHOULD NOT BE ALLOWED TO INCREASE.

CANADA + FAILURE, OPERATOR ERROR + *INCIDENT + *PERSONNEL EXPOSURE, RADIATION

40267
HASKINS J
IMAGING WITH NEUTRONS
GENERAL ELECTRIC COMPANY, SAN JOSE, CALIFORNIA
4 PAGES, INDUSTRIAL RESEARCH, 11(7), PAGES 40-43 (JULY 1969)

CONTINUED DEVELOPMENT AND IMPROVEMENT OF NEUTROGRAPHY LED TO EARLY IDENTIFICATION OF SEVERAL PROMISING APPLICATIONS IN THE NUCLEAR AND AEROSPACE INDUSTRIES. NEUTROGRAPHY'S FIRST COMMERCIAL APPLICATION WAS EXAMINING NUCLEAR FUEL ELEMENTS. NEUTRON RADIOGRAPHY NOT ONLY DISTINGUISHES BETWEEN CERTAIN HEAVY ELEMENTS, SUCH AS URANIUM AND PLUTONIUM, BUT ALSO DISCRIMINATES BETWEEN ISOTOPES OF A GIVEN ELEMENT. THESE PROPERTIES, COUPLED WITH THE CAPABILITY OF HYDROGEN DETECTION ALLOW NOT ONLY EXAMINATION OF NUCLEAR ELEMENTS BUT ALSO THE DETECTION OF HYDROGEN AND HYDRIDE EMBRITTLEMENT IN METAL CLADDING MATERIALS. BECAUSE OF THIS, NEUTROGRAPHY IS PLAYING AN ESPECIALLY IMPORTANT PART IN THE DEVELOPMENT OF FAST REACTOR FUELS.

*REACTOR, FAST + FAILURE, FUEL ELEMENT + FUEL MELTDOWN + TEST, NONDESTRUCTIVE + FAILURE, CLADDING + *NEUTRON

38956
STEWART KP
COATING CONTAMINATION IN LONG-TERM-ANNEAL BISO PARTICLES
GULF GENERAL ATOMIC, INC., SAN DIEGO, CALIFORNIA
GAMO-9056 +. 33 PAGES, JUNE 30, 1969

LONG-TERM ANNEAL BISO PARTICLES SHOWING DIFFERENT AMOUNTS OF RADIOGRAPHICALLY DETECTABLE CONTAMINATION AT THE PARTICLE SURFACES HAVE BEEN PICKED OUT, SECTIONED, AND ANALYZED USING THE ELECTRON MICROSCOPE. THE CONTAMINATION, VISIBLE ON THE RADIOGRAPHS AS BRIGHT RINGS AT THE PARTICLE SURFACE, ARISES FROM CORE MIGRATION OUTWARDS RATHER THAN FROM AN EXTERNAL SOURCE. THE HEAVY METAL CONCENTRATION IN THESE RINGS IS UP TO ABOUT 40 PERCENT BY WEIGHT RELATIVE TO THE PYC. THE THORIUM AND URANIUM CONCENTRATION WITHIN THE REST OF THE PYC ARE RELATIVELY CONSTANT AND ONLY A FEW HUNDREDTHS WEIGHT PERCENT IN EACH CASE.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 \$3.00 COPY, \$0.65 MICROFICHE

*COATED PARTICLE + DIFFUSION + *FUEL INTEGRITY + PYROLYTIC + ELECTRON MICROSCOPY + *X-RAY

16047
TENNEY GH
THE ROLE OF NON-DESTRUCTIVE TESTING IN THE LOS ALAMOS REACTOR PROGRAMME
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
STI/PUB/105 +. 14 PAGES, 9 FIGURES, 7 REFERENCES, PP. 109-123, PROCEEDINGS OF A SYMPOSIUM ON NON-DESTRUCTIVE TESTING IN NUCLEAR TECHNOLOGY, HELD BY THE INTERNATIONAL ATOMIC ENERGY AGENCY IN BUCHAREST, ROMANIA, MAY 17-21, 1965, IN TWO VOLUMES, VOLUME II, OCTOBER 1965

BRIEFLY DESCRIBES INSTRUMENTS DEVELOPED AND USED AT LOS ALAMOS. RADIOGRAPHY IS USED TO CHECK GOLD SURFACES FOR EMBEDDED IMPURITIES. ULTRASONIC INSPECTION IS MADE ON BAR STOCK FOR INTERNAL CRACKS. URANIUM MIGRATION AS A FUNCTION OF TEMPERATURE IN 150 MICRO-IN.-DIAMETER PYROCARBON-COATED URANIUM CARBIDE BEADS IS EVALUATED BY MICRORADIOGRAPHY AND ELECTRON MICROSCOPY.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATIONS, 317 EAST 34TH STREET, NEW YORK, N.Y., 10016,

16047 *CONTINUED*
\$4.50 COPY

COATED PARTICLE + FABRICATION + CLADDING + MEASUREMENT + METAL + *TESTING + TEST, PROOF + UHTREX (GCR) + LAPRE
1 AND 2 (RE) + LASL + COATING + INSTRUMENT, FUEL SCANNING + *TEST, NONDESTRUCTIVE + LAMPRE 1 (RE) +
EXAMINATION + QUALITY ASSURANCE

39655
IDDINGS FA + BOSTROM NA
UTILIZATION OF A LOW VOLTAGE ACCELERATOR FOR NEUTRON RADIOGRAPHY
LOUISIANA STATE UNIVERSITY, BATON ROUGE + ACCELERATORS, INC., AUSTIN, TEXAS
10 PAGES, 16 FIGURES, PP. 363-372 OF THE PROCEEDINGS OF THE 7TH SYMPOSIUM ON NONDESTRUCTIVE EVALUATION OF
COMPONENTS AND MATERIALS IN AEROSPACE, WEAPONS AND NUCLEAR APPLICATIONS, SAN ANTONIO, TEXAS, APRIL 23-25,
1969

NEUTRON RADIOGRAPHS CAN BE PRODUCED IN EXPOSURES AS SHORT AS ONE MINUTE WITH EFFICIENT NEUTRON
CONVERTERS AND FAST FILM. METAL FOIL CONVERTERS GIVE RADIOGRAPHS WITH EXPOSURES OF 30 MINUTES OR
LESS. NEUTRON RADIOGRAPHS SHOWING RESOLUTION OBTAINABLE WITH A SIMPLE SET UP AND SHORT EXPOSURES
ARE PRESENTED. DATA SHOWING CEUTERIUM AND TRITIUM TARGET LIVES TO BE LONG ENOUGH FOR USE ARE
PRESENTED. RESULTS FROM A VARIETY OF CONVERSION MATERIALS SUCH AS LIF/ZNS SCREEN, GO, AND IR ARE
PICTURED. ALSO INCLUDED ARE SOME PRELIMINARY DATA FROM WORK USING AN IMAGE INTENSIFYING SYSTEM.

AVAILABILITY - F.A. IDDINGS, NUCLEAR SCIENCE CENTER, LOUISIANA STATE UNIVERSITY, BATON ROUGE, LOUISIANA 70803

TEST, NONDESTRUCTIVE + *NEUTRON + ACCELERATOR

66200
FUJITA H + IRIE K
RADIOGRAPHIC INSPECTION FOR NUCLEAR PRESSURE VESSELS BY ELECTRON LINAC USED FOR NONDESTRUCTIVE TEST
MITSUBISHI ELECTRIC CORPORATION, TOKYO
8 PAGES, MITSUBISHI JUKO GIHO, 6, PP. 358-405, JULY 1969 (IN JAPANESE)

THE ELECTRON LINAC MODEL ML-15R WAS DEVELOPED FOR NONDESTRUCTIVE TESTING. THE MAIN FEATURES OF
THIS APPARATUS, WHICH EMPLOYS A 5-MW KLYSTRON AS A MICROWAVE POWER SOURCE, ARE ITS AMPLIFIED OUTPUT
AND STABLE OPERATION. THE MAXIMUM ENERGY OF THE ELECTRON BEAM IS 12 MEV AND X-RAY OUTPUT CAN BE
CONTINUOUSLY VARIED IN A WIDE RANGE FROM 2000 TO 10 R/MIN AT 1 M. PENETRATOR SENSITIVITY
WITH WIRE AND ASME TYPE WAS COMPARED FOR STEELS WITH THICKNESSES FROM 23 TO 360 MM. A FORMULA
FOR IMAGE QUALIFICATION INDICATOR (PENETRATOR) SENSITIVITY FOR DIFFERENT HOLE DIAMETERS ON THE
BASIS OF IMAGE UNSHARPNESS WAS DEVELOPED.

*PRESSURE VESSEL + *TEST, NONDESTRUCTIVE + BETA RAY + *STEEL + THICKNESS + *FLAW

32290
CRAMER EN
RECENTLY REPORTED OCCURRENCES OF NUCLEAR-SAFETY-RELATED SIGNIFICANCE
OAK RIDGE NATIONAL LAB., TENN.
4 PAGES, 15 REFERENCES, NUCLEAR SAFETY, 10(2), PAGES 175-179 (MARCH-APRIL 1969)

BRIEF PARAGRAPHS ON (1) INSPECTION OF OYSTER CREEK 1 NOZZLES SHOWS AMOUNT OF LIQUID-PENETRANT
BLEEDOUT TO BE SIGNIFICANT IN FINDING DEEP CRACKS BRANCHING FROM ALLOWABLE SURFACE DEFECTS, (2)
TUBING-FITTING FAILURE CAUSES LEAK AND LOSS OF PRESSURIZER LEVEL INDICATION ON N.S. SAVANNAH, (3)
REFLECTOR FLOODING DISTURBS POWER CALIBRATION OF NEUTRON-MONITORING CHANNELS AT TEXAS A AND M
TRIGA, (4) BORIC ACID CRYSTALS AGAIN PLUG INJECTION PUMPS AT SAN ONOFRE, (5) COMPLIANCE LETTERS -
OCTOBER-NOVEMBER 1968, (6) IN 5 INSTANCES, 13 PERSONS WERE AFFECTED BY RADIOGRAPHY FAILURES,
GIVING DOSES UP TO 5.7 R (WHOLE BODY) AND 240 REMS (HAND).

REACTOR, BWR + *INCIDENT COMPILATION + REACTOR, PWR + REACTOR, RESEARCH

67495
MCGUFFEY JR
TRAINING OF NDT INSPECTORS FOR COMPLIANCE WITH NUCLEAR STANDARDS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
CONF-710416 +. 11 PAGES, PAPER 9 FROM THE SYMPOSIUM ON TRAINING OF NUCLEAR FACILITY PERSONNEL, APRIL 19, 1971

ALL INSPECTORS INVOLVED IN RADIOGRAPHY, MAGNETIC PARTICLE, ULTRASONIC AND LIQUID PENETRANT
EXAMINATIONS MUST BE QUALIFIED AND CERTIFIED TO THE TRAINING PROGRAM OF ASNT RECOMMENDED PRACTICE
NO. SNT-TC-1A. THE PURPOSE OF THE TRAINING PROGRAM IS TO EFFECT A UNIFORM METHOD OF SELECTING
QUALIFIED INSPECTORS AND THUS INCREASE THE CONFIDENCE LEVEL REGARDING THE SOUNDNESS OF THE WELDS
AND THE IMMEDIATELY ADJACENT BASE METAL. DESCRIBES THE PROGRAM FOR TRAINING THOSE WHO RUN
NONDESTRUCTIVE TESTS OF PRESSURE VESSELS, PIPING, VALVES, ETC.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, SPRINGFIELD, VA. 22151 1-300 P. \$3 (\$6 AFTER 2 YR.),
300-600 P. \$6, 600-900 P. \$9, FILM (ANY SIZE) \$0.95

*TRAINING + *TEST, NONDESTRUCTIVE + ULTRASONICS

66517

66517 *CONTINUED*

MCCLUNG RW
NOT - A STATE-OF-THE-ART REPORT
6 PAGES, OAK RIDGE NATIONAL LABORATORY REVIEW, 4(3), PP. 20-25

BRIEF NONTECHNICAL PRESENTATION OF SOME WIDELY USED NONDESTRUCTIVE TESTS - RADIOGRAPHY, ULTRASONICS, PENETRANTS.

*TEST, NONDESTRUCTIVE + *SYSTEM DESCRIPTION + ULTRASONICS

16053

FRANCIS WC + BROWN ES + BURDICK EE + GIBSON GW + TINGEY FH
THE ROLE OF NON-DESTRUCTIVE TESTING IN TEST-REACTOR OPERATION AT THE NATIONAL REACTOR TESTING STATION
PHILLIPS PETROLEUM COMPANY, IDAHO FALLS
STI/PUB/105 +. 18 PAGES, 10 REFERENCES, 6 FIGURES, PP. 331-349, PROCEEDINGS OF A SYMPOSIUM ON NON-DESTRUCTIVE TESTING IN NUCLEAR TECHNOLOGY, HELD BY THE INTERNATIONAL ATOMIC ENERGY AGENCY IN BUCHAREST, ROMANIA, MAY 17-21, 1965, IN TWO VOLUMES, VOLUME II, OCTOBER 1965

DISCUSSES GAMMA-SCANNING OF ELEMENTS FOR FUEL CONTENT, ULTRASONIC DETECTION OF BRITTLE FRACTURE, RADIOGRAPHIC INSPECTION OF FUEL PLATES AND WELDS, AND EDDY-CURRENT GAUGING OF CORROSION-FILM THICKNESS ON IRRADIATED PLATES.

AVAILABILITY - NATIONAL AGENCY FOR INTERNATIONAL PUBLICATION, 317 EAST 34TH STREET, NEW YORK, N.Y., 10016, \$4.50 COPY

FABRICATION + FUEL INTEGRITY + NRTS + TESTING + WELDS + CORROSION + *FUEL ELEMENT + *TEST, NONDESTRUCTIVE + EXAMINATION + *QUALITY ASSURANCE

56330

CRISCUOLO EL + DYER CH + CASE DP
THE FEASIBILITY OF X-RAY INSPECTION OF WELDS USING SCATTERED RADIATION
SHIP STRUCTURE COMMITTEE, WASHINGTON, D.C.
AD-263.030 +. 28 PAGES, JULY 28, 1961

THEORETICAL AND EXPERIMENTAL WORK WAS CONDUCTED TO DEVELOP A RADIOGRAPHIC FLAW DETECTION TECHNIQUE USING SOURCE AND FILM LOCATED ON THE SAME SIDE OF THE PLATE. IN VIEW OF A SERIOUS LIMITATION ON THE DEPTH AT WHICH DISCONTINUITIES IN STEEL CAN BE DETECTED (0.20 IN.) AND LONG EXPOSURE TIME (20 MIN. AT 250 KV), THE METHOD IS CONSIDERED TO BE UNSATISFACTORY AS A CRITICAL INSPECTION TOOL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, UNITED STATES DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22151 \$3.00 COPY, \$0.65 MICROFICHE

*FLAW + *COMPARISON, THEORY AND EXPERIENCE + *INSTRUMENT, DETECTION FAILED FUEL ELEMENT + WELDS + X-RAY

17187

TOWLE LH
INSTRUCTORS GUIDE - SURVEY OF NUCLEAR FUNDAMENTALS AND RADIOISOTOPE APPLICATIONS IN INDUSTRY
STANFORD RESEARCH INSTITUTE, CALIFORNIA
SRIA-19 +. 91 PAGES, 20 FIGURES, JULY 1960

OUTLINE (LESSON PLAN, ILLUSTRATIONS, AND READING ASSIGNMENTS) FOR A 27-HR COURSE TO TRAIN WORKERS AND TECHNICIANS IN NUCLEAR FUNDAMENTALS AND INDUSTRIAL RADIOISOTOPE APPLICATIONS, SUCH AS IN RADIOGRAPHY, GAGING, AND TRACING. THE GUIDE CONTAINS NINE SECTIONS, EACH CONTAINING PLANS FOR LECTURES AND DISCUSSIONS, AND QUESTIONS FOR STUDENT DISCUSSION - (1) PRINCIPLES OF ATOMIC STRUCTURE, (2) PRINCIPLES OF RADIOACTIVITY, (3) RADIATION SAFETY, (4) RADIOGRAPHY, (5) RADIATION GAGES, (6) RADIOISOTOPE TRACERS, (7) OTHER INDUSTRIAL APPLICATIONS OF RADIATION SOURCES, (8) HANDLING RADIOACTIVE MATERIALS, (9) RADIOISOTOPES UTILIZATION AND PEOPLE. BACKGROUND READINGS FOR INSTRUCTORS AND INFORMATION ON PROCUREMENT OF TRAINING FILMS AND CHARTS IS ALSO GIVEN. (SEE SRIA-20 FOR REPORT ON ITS DEVELOPMENT.)

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, GOVERNMENT PRINTING OFFICE, WASHINGTON 25, D.C., \$0.75 COPY

TRACER, RADIOACTIVE + *TRAINING + RADIATION SAFETY AND CONTROL

22827

DRL INFORMATION LETTER ON RADIOGRAPHERS OVEREXPOSURE
U. S. ATOMIC ENERGY COMMISSION, WASHINGTON, D. C.
6 PAGES, INFORMATION LETTER TO ALL RADIOGRAPHY LICENSEES, MARCH 1963

GIVES ONE-PARAGRAPH DESCRIPTIONS OF 14 CASES (DOSES, 2 TO 6 REMS) WHERE RADIOGRAPHERS WERE EXPOSED TO UNSHIELDED SOURCES (DUE TO WARNING-SYSTEM FAILURES OR HEEDLESS ACTION) WHICH COULD HAVE BEEN PREVENTED HAD THE OPERATOR USED SURVEY INSTRUMENTS EACH TIME (AS IN 10 CFR 34.43). ASKS THE LICENSEES TO REQUIRE THAT RADIOGRAPHERS READ LETTER AND TO STRESS PROPER USE OF SURVEY INSTRUMENTS IN PERIODIC TRAINING PROGRAMS.

AVAILABILITY - USAEC, DIVISION OF LICENSING AND REGULATION, WASHINGTON, D. C.

FAILURE, OPERATOR ERROR + PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + *INCIDENT, HUMAN ERROR + *INFORMATION RETRIEVAL

22225
 LICENSES FOR RADIOGRAPHY, AND RADIATION SAFETY REQUIREMENTS FOR RADIOGRAPHIC OPERATIONS
 U. S. ATOMIC ENERGY COMMISSION, WASHINGTON, D. C.
 10-CFR-34 +. 3 PAGES, JUNE 29, 1965

(SUB-PART A) - REVIEWS REQUIREMENTS FOR ISSUANCE OF SEALED-SOURCE LICENSE. (SUB-PART B, RADIATION SAFETY REQUIREMENTS) - EQUIPMENT CONTROL (LOCKING, STORING, LEAK TESTING, LOGBOOKS). PERSONAL SAFETY (TRAINING, WRITTEN PROCEDURES, DOSE MONITORING). PRECAUTIONARY PROCEDURES (DIRECT SURVEILLANCE, POSTING, SURVEY AFTER USAGE).

AVAILABILITY - U. S. ATOMIC ENERGY COMMISSION, WASHINGTON, D. C.

*REGULATION, AEC + RADIATION SAFETY AND CONTROL

27334
 AEC DEVELOPS BASIC TEXT AND COURSE FOR INDUSTRIAL RADIOGRAPHERS
 UNITED STATES ATOMIC ENERGY COMMISSION
 2 PAGES, AEC PRESS RELEASE L-169, JULY 25, 1968

THE AEC AND OFFICE OF EDUCATION HAVE PUBLISHED A 3-VOLUME TEXT FOR TRAINING INDUSTRIAL RADIOGRAPHERS. (OE 84036) INDUSTRIAL RADIOGRAPHY MANUAL, \$1.25, (OE 84035) INDUSTRIAL RADIOGRAPHY STUDENT GUIDE AND LABORATORY EXERCISES, \$0.55. (OE 84034) INDUSTRIAL RADIOGRAPHY INSTRUCTOR GUIDE, \$0.40. ***TEXT IS DESIGNED FOR AN 80-HR BASIC COURSE FOR HIGH SCHOOL GRADUATES AND WAS WRITTEN BY H.D. RICHARDSON OF LOUISIANA STATE U.

USAEC, DIVISION OF PUBLIC INFORMATION, WASHINGTON, D.C. 20545

*TRAINING

31356
 1968 USA RADIATION INCIDENT EXPERIENCE
 U.S. ATOMIC ENERGY COMMISSION
 5 PAGES, PG. 140-143, 152 OF MAJOR ACTIVITIES IN THE ATOMIC ENERGY PROGRAMS, JANUARY 1969

(PAGE 140) AEC INSPECTIONS TOTALLED 2406 (MATERIALS) AND 489 (REACTORS) AND ISSUED A TOTAL OF 60 AND 27 CITATIONS RESPECTIVELY. ONE LICENSE WAS NOT RENEWED, AND ONE OPERATION WAS STOPPED. BLS SURVEY SHOWED ATOMIC ENERGY HAS BETTER THAN AVERAGE WORK-INJURY EXPERIENCES. IN 1967, FILM-BADGE READINGS SHOWED 4000 ABOVE 1 REM. *** OF 17 INCIDENTS, 8 WERE IN RADIOGRAPHY (800 REMS HAND, 36 WHOLE BODY) AND 7 WERE CONTAMINATIONS FROM LICENSED BY-PRODUCT MATERIAL. 31 AND 7 WERE CONTAMINATIONS FROM LICENSED BY-PRODUCT MATERIAL. 31 SOURCES WERE LOST. *** IN AEC OPERATIONS, ONE PERSON RECEIVED A 655-REM HAND DOSE, AND ANOTHER A 500-TO 1000- REM X-RAY HAND DOSE. *** TWO SEMINARS ON MEDICAL CARE PLANNING WERE HELD FOR PHYSICIANS.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

*INCIDENT, EXPOSURE + INCIDENT COMPILATION + REACTOR, RESEARCH + REACTOR, POWER + CONTAMINATION + PERSONNEL EXPOSURE, RADIATION + X-RAY + INDUSTRIAL SAFETY

46452
 AEC PLANS TO REQUIRE INSPECTION
 U.S. ATOMIC ENERGY COMMISSION
 AEC PRESS RELEASE N-109 +. 1 PAGE, JUNE 26, 1970

UNDER A PROPOSED AMENDMENT TO PART 34, A LICENSEE AUTHORIZED TO USE SEALED RADIOACTIVE SOURCES IN RADIOGRAPHY WOULD BE REQUIRED TO HAVE AN INSPECTION AND MAINTENANCE PROGRAM FOR THE RADIOGRAPHIC EXPOSURE DEVICES AND STORAGE CONTAINERS WHICH HE USES. THE LICENSEE COULD EITHER INCORPORATE THE RECOMMENDATIONS OF THE EQUIPMENT MANUFACTURER INTO HIS PROGRAM OR HE COULD INDEPENDENTLY PREPARE INSTRUCTIONS FOR CONSIDERATION BY THE COMMISSION. THE LICENSEES PROGRAM FOR INSPECTION AND MAINTENANCE OF RADIOGRAPHY EQUIPMENT WOULD BE SUBJECT TO PERIODIC INSPECTION BY THE COMMISSIONS DIVISION OF COMPLIANCE.

USAEC, DIVISION OF PUBLIC INFORMATION, WASHINGTON, D.C. 20545

*MAINTENANCE AND REPAIR + *REGULATION, AEC + EXAMINATION + *EQUIPMENT + SURVEILLANCE PROGRAM

61723
 AEC TO REQUIRE INSPECTION AND MAINTENANCE PROCEDURES FOR RADIOGRAPHIC EQUIPMENT
 U. S. ATOMIC ENERGY COMMISSION
 AEC PRESS RELEASE N-198 +. 1 PAGE, NOVEMBER 13, 1970

UNDER AN AMENDMENT TO PART 34, A LICENSE AUTHORIZED TO USE SEALED RADIOACTIVE SOURCES IN RADIOGRAPHY WILL BE REQUIRED TO HAVE AN INSPECTION AND MAINTENANCE PROGRAM FOR THE RADIOGRAPHIC EXPOSURE DEVICES AND STORAGE CONTAINERS WHICH HE USES. THE LICENSEE WILL EITHER INCORPORATE THE RECOMMENDATIONS OF THE EQUIPMENT MANUFACTURER INTO HIS PROGRAM OR HE MAY INDEPENDENTLY PREPARE INSTRUCTIONS FOR CONSIDERATION BY THE COMMISSION. THE LICENSEE PROGRAM FOR INSPECTION AND MAINTENANCE OF RADIOGRAPHY EQUIPMENT WILL BE SUBJECT TO PERIODIC INSPECTION BY THE COMMISSIONS DIVISION OF COMPLIANCE. THE AMENDMENT IS INTENDED TO REDUCE THE NUMBER OF RADIATION EXPOSURES ATTRIBUTABLE TO IMPROPERLY MAINTAINED EQUIPMENT.

61723 *CONTINUED*
AVAILABILITY - USAEC, DIVISION OF PUBLIC INFORMATION, WASHINGTON, D.C. 20545

*REGULATION, AEC + *EXAMINATION + *MAINTENANCE AND REPAIR + *EQUIPMENT

60868
AEC PROPOSES REGULATION CHANGES TO PROVIDE FOR FINES FOR LICENSE VIOLATION
U. S. ATOMIC ENERGY COMMISSION
AEC PRESS RELEASE N-219 +. 1 PAGE, DECEMBER 17, 1970

THE ATOMIC ENERGY COMMISSION IS PROPOSING AMENDMENTS UNDER WHICH IT COULD IMPOSE A FINE FOR VIOLATION OF THE LICENSING PROVISIONS. A PENALTY WOULD NOT EXCEED \$5,000 FOR EACH VIOLATION, WITH A TOTAL PENALTY OF \$25,000 PAYABLE BY ANY PERSON FOR ALL VIOLATIONS OCCURRING WITHIN A PERIOD OF 30 CONSECUTIVE DAYS. AMENDMENTS WOULD BE APPLICABLE TO ALL CLASSES OF MATERIALS AND FACILITY LICENSES. FINES WILL BE USEFUL IN THOSE CASES IN WHICH LICENSE SUSPENSION OR REVOCATION IS NOT IN THE PUBLIC INTEREST BUT WHERE THE IMPORTANCE OF FULL ADHERENCE TO REGULATORY REQUIREMENTS SHOULD BE EMPHASIZED.

AVAILABILITY - USAEC, DIVISION OF PUBLIC INFORMATION, WASHINGTON, D. C. 20545

*REGULATION, AEC + *TECHNICAL SPECIFICATIONS + *FAILURE, ADMINISTRATIVE CONTROL + RADIOCHEMICAL PROCESSING + RADIOLOGY + REACTOR, POWER

08664
A GUIDE ON RADIATION SAFETY CONSIDERATIONS IN THE PREPARATION OF LICENSE APPLICATIONS
DIVISION OF LICENSING AND REGULATION, U. S. ATOMIC ENERGY COMMISSION
AEC LICENSING GUIDE 14- 81 PAGES- GPO, \$0.65 CY

TO PROVIDE GENERAL GUIDANCE IN PREPARING AN APPLICATION FOR A LICENSE AUTHORIZING THE USE OF SEALED SOURCES IN RADIOGRAPHY. RADIOGRAPHY AS USED IN THIS GUIDE MEANS THE EXAMINATION OF THE STRUCTURE OF MATERIALS BY NONDESTRUCTIVE METHODS, UTILIZING SEALED SOURCES OF BYPRODUCT MATERIAL. TO PROVIDE ILLUSTRATIVE GUIDANCE AND SHOULD NOT BE CONSIDERED A SUBSTITUTE FOR THE APPLICANTS CAREFUL EVALUATION OF HIS PROPOSED USE OF SEALED SOURCES, OR FOR HIS ASSURING THAT THE APPLICATION CORRECTLY AND ADEQUATELY DESCRIBES THE RADIATION SAFEGUARDS AND PROCEDURES HE WILL FOLLOW. INFORMATION NOT SPECIFICALLY DISCUSSED HEREIN SHOULD BE INCLUDED IF THE APPLICANT CONSIDERS IT TO BE AN IMPORTANT PART OF HIS RADIATION SAFETY PROGRAM. INCLUDES COPIES OF PERTINENT 10 CFR PARTS, AND A SAMPLE APPLICATION.

SAFETY REVIEW + *REGULATION, AEC

67380
AEC LICENSING GUIDE - INDUSTRIAL RADIOGRAPHY
U.S. ATOMIC ENERGY COMMISSION, DIVISION OF MATERIALS LICENSING, WASHINGTON, D.C.
34 PAGES, AEC LICENSING GUIDE, NOVEMBER 1970

THE PURPOSE OF THIS BOOKLET IS TO PROVIDE GENERAL GUIDANCE TO PERSONS WISHING TO APPLY FOR AN ATOMIC ENERGY COMMISSION LICENSE AUTHORIZING THE USE OF SEALED RADIOACTIVE SOURCES IN INDUSTRIAL RADIOGRAPHY. THE BOOKLET DOES NOT PROVIDE THE KNOWLEDGE AND COMPETENCY NECESSARY TO A SAFE AND EFFECTIVE RADIOGRAPHIC PROGRAM NOR WILL IT RECOMMEND SPECIFIC EQUIPMENT. IF APPLICANT IS NOT ADEQUATELY TRAINED OR EQUIPPED, MERELY READING THIS BOOKLET WILL NOT QUALIFY HIM FOR A LICENSE.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

*APPLICATION FOR AEC LICENSE + *GUIDE

22826
SECOND DRL INFORMATION LETTER ON RADIOGRAPHERS OVEREXPOSURE
USAEC, DIVISION OF STATE AND LICENSEE RELATIONS, WASHINGTON, D. C.
6 PAGES, INFORMATION LETTER TO ALL RADIOGRAPHY LICENSEES, JUNE 14, 1965

SUMMARIZES 14 INCIDENTS THAT OCCURRED SINCE FIRST LETTER (MARCH 1963). AGAIN, THE CAUSE FOR MOST OF THEM (DOSES 1 TO 16 REMS) CAN BE TRACED TO THE FAILURE OF RADIOGRAPHERS TO PROPERLY USE RADIATION-SURVEY INSTRUMENTS. ASKS CONTINUED INTEREST OF LICENSEE. MANAGEMENT TO REVIEW OPERATIONS AND EQUIPMENT AND TO STRESS SOUND PROCEDURES AND ATTENTION TO EQUIPMENT.

AVAILABILITY - USAEC, DIVISION OF STATE AND LICENSEE RELATIONS, WASHINGTON, D. C.

FAILURE, OPERATOR ERROR + PERSONNEL EXPOSURE, RADIATION + RADIATION SAFETY AND CONTROL + INCIDENT, HUMAN ERROR + INFORMATION RETRIEVAL

11971
INCIDENTS RELATED TO NUCLEAR SAFETY IN AEC OPERATIONS
DIVISION OF OPERATIONAL SAFETY USAEC
4 PAGES, 1 TABLE, 6 REFERENCES, NUCLEAR SAFETY 7(4), PAGES 495-498 (SUMMER 1966)

INCIDENTS COMPILED FOR CALENDAR YEAR 1965. REPORTING CRITERIA ARE PERSONNEL DOSE GREATER THAN 1 QUARTER OR COST GREATER THAN 5000 DOLLARS. VARIOUS X RAY AND RADIOGRAPHY INCIDENTS DUE TO POOR

11971 *CONTINUED*

TECHNIQUE AND COMPONENT FAILURE, AND VARIOUS CHEMICAL PROCESSING INCIDENTS RELEASED RADIOACTIVE MATERIALS IN THE WORKING AREA. SOME INCIDENTS HAVE BEEN REVIEWED IN DETAIL IN VARIOUS AEC BULLETINS.

*INCIDENT COMPILATION + PERSONNEL EXPOSURE, RADIATION + REACTOR, AEC OWNED + RADIOCHEMICAL PROCESSING

25276

A SUMMARY OF INDUSTRIAL ACCIDENTS IN USAEC FACILITIES 1965-1966
USAEC, DIVISION OF OPERATIONAL SAFETY
TID-5360(SUPPL.6) +. 49 PAGES, DECEMBER 1967

111 OCCURRENCES (EXPOSURES ABOVE QUARTERLY LIMIT OR LOSSES GREATER THAN \$5000) LISTED. HIGHEST EXPOSURE WAS 50 REMS (AT AN ACCELERATOR), AND HIGHEST LOSS WAS \$1.45 MILLION (HARVARD ACCELERATOR FIRE). OF THE 14 DEATHS, 8 WERE FROM FALLS OR FALLING OBJECTS, 3 FROM ELECTROCUTION, 2 FROM BURNS OR EXPLOSIONS (INCLUDING 1 FROM BURNING RECORDING TAPES PRIOR TO DISPOSAL IN A WASTE PIT), AND 2 FROM AUTO ACCIDENTS. THE ONLY SERIOUS REACTOR ACCIDENT (PRTR FUEL FAILURE) COST \$0.895 MILLION (SECOND HIGHEST COST) BUT PRODUCED NO EXPOSURES ABOVE NORMAL LIMITS.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402, \$0.35 COPY

EXPLOSION + FIRE + FUEL MELTDOWN + FAILURE, OPERATOR ERROR + *INCIDENT COMPILATION + PRTR (TRI) + REACTOR, TEST + REACTOR, POWER + INCIDENT, FATALITY + CONTAMINATION + INCINERATION + PERSONNEL EXPOSURE, RADIATION + INCIDENT, NONREACTOR + INCIDENT, NONNUCLEAR + ACCELERATOR + INDUSTRIAL SAFETY

06910

HAYES DF

A SUMMARY OF INCIDENTS INVOLVING RADIOACTIVE MATERIAL IN ATOMIC ENERGY ACTIVITIES, JANUARY-DECEMBER 1956
U. S. ATOMIC ENERGY COMMISSION, DIVISION OF ORGANIZATION AND PERSONNEL
25 PAGES, FIGURES- AUGUST 1957, TID-5360(SUPPL.)- CFSTI

SHORT DESCRIPTIONS OF 21 INCIDENTS OF VARYING CAUSES, AND IN GENERAL, OF MINOR RESULTS. WHOLE BODY DOSES WERE LESS THAN 38 REM AND PROPERTY DAMAGE LESS THAN \$125,000.

ADMINISTRATIVE CONTROL + *ACCIDENT, CONSEQUENCES + *INCIDENT COMPILATION + *SOURCE, RADIATION + *ACCIDENT, TRANSPORTATION + *ACCIDENT, CRITICALITY + INCIDENT + *RADIATION SAFETY AND CONTROL + INCIDENT, NONREACTOR

38947

ISOTOPE DEVICE SAFETY TESTING STUDY - INDUSTRIAL GAUGES AND RADIOGRAPHY DEVICES
US ATOMIC ENERGY COMMISSION, DIVISION OF TECHNICAL INFORMATION
ORO-3610-1 +. 87 PAGES, 10 TABLES, JULY 10, 1969

UNDERWRITERS LABORATORIES, INC. HAS COMPLETED A REVIEW OF SAFETY CONSIDERATIONS CONCERNING INDUSTRIAL GAUGING EQUIPMENT AND RADIOGRAPHY DEVICES CONTAINING RADIOISOTOPES. THE INVESTIGATION INCLUDED STUDIES OF THE CONSTRUCTION OF THESE DEVICES AND THEIR INSTALLATION AND OPERATION IN THE FIELD. FOLLOWING THESE STUDIES, COMMERCIAL SAMPLES OF THESE DEVICES, REPRESENTATIVE OF EQUIPMENT NOW IN COMMERCIAL USE, WERE SET UP IN A LABORATORY AND SUBJECTED TO A NUMBER OF TESTS INTENDED TO EVALUATE FEATURES OF THE DEVICES RELATING TO THEIR SAFE USE AND OPERATION. DESCRIPTIONS OF THESE TESTS, AND THE RESULTS OBTAINED, ARE INCLUDED IN THIS REPORT, WHICH IS CONCLUDED WITH RECOMMENDATIONS FOR PERFORMANCE TESTS APPLICABLE TO THE SAFETY EVALUATION OF THESE DEVICES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. 22151 \$3.00 COPY, \$0.65 MICROFICHE

*INSTRUMENT, NUCLEAR + *DESIGN STUDY + INSTRUMENT, COMPONENT + TEST, INSTRUMENT RESPONSE + REVIEW + *SAFETY EVALUATION + *INDUSTRIAL SAFETY

33072

WOOD VA

A COLLECTION OF RADIUM LEAK TEST ARTICLES
U. S. DEPT. OF HEALTH, EDUCATION, AND WELFARE
MORP-68-1 +. 15 PAGES, FIGURES, TABLES, REFERENCES, MARCH 1968

REPORT CONSISTS OF A COLLECTION OF 16 ARTICLES ON METHODS OF RADIUM LEAK TESTING FOR USE BOTH IN THE FIELD AND IN PERMANENT INSTALLATIONS.

AVAILABILITY - U. S. DEPT. OF HEALTH, EDUCATION, AND WELFARE, BUREAU OF DISEASE PREVENTION AND ENVIRONMENTAL CONTROL, NATIONAL CENTER FOR RADIOLOGICAL HEALTH, ROCKVILLE, MD. 20852

*INSTRUMENT, RADIATION MONITORING + MEASUREMENT + SOURCE, RADIATION + TESTING + *RADIUM + RADON + HELIUM + *RADIATION SAFETY AND CONTROL + *CONTAINMENT LEAK MONITOR + LEAK RATE + *LEAK

63343

GUNDACKER WE + MOORE TM + COPPOLA SA

A STUDY TO DETERMINE THE NECESSITY FOR THE DEVELOPMENT OF STANDARDS FOR THE USE OF SELECTED NONMEDICAL ELECTRONIC PRODUCTS FOR COMMERCIAL AND INDUSTRIAL PURPOSES
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE, ROCKVILLE, MARYLAND

63343 *CONTINUED*
BRH/DEP 70-30 +. 11 PAGES, FIGURES, TABLES, REFERENCES, DECEMBER 1970

THIS REPORTS PRESENTS THE FINDINGS OF A STUDY CONDUCTED DURING 1969 TO DETERMINE THE NEED FOR DEVELOPING STANDARDS FOR THE USE OF SELECTED NONMEDICAL ELECTRONIC PRODUCTS FOR COMMERCIAL AND INDUSTRIAL PURPOSES. THREE CLASSES OF PRODUCTS WERE INVESTIGATED - INDUSTRIAL RADIOGRAPHIC AND FLUOROSCOPIC X-RAY UNITS, PARTICLE ACCELERATORS, AND ANALYTICAL X-RAY EQUIPMENT. FOR EACH CATEGORY THE EQUIPMENT, ITS TYPICAL USES, AND THE ATTENDANT RADIATION HAZARDS ARE DESCRIBED, AND RADIATION SAFETY MEASURES ARE DISCUSSED. EXISTING GUIDELINES AND CONTROLS FOR EACH CLASS OF EQUIPMENT ARE PRESENTED, AND INCIDENTS INVOLVING RADIATION EXPOSURE ARE REVIEWED. THE NEED FOR STANDARDS FOR THE USE OF THE EQUIPMENT IS ALSO DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, SPRINGFIELD, VA. 22151 1-300 P. \$3 (\$6 AFTER 2 YR.), 300-600 P. \$6, 600-900 P. \$9, FILM (ANY SIZE) \$0.95

ACCELERATOR + *X-RAY + *CODES AND STANDARDS + ADMINISTRATIVE CONTROL + HAZARD, RELATIVE + GUIDE + INDUSTRIAL SAFETY + *RADIATION SAFETY AND CONTROL + GUIDE

19491
HEFFAN H
RADIATION SAFETY IN RADIOGRAPHY
U.S. NAVAL WEAPONS STATION, CONCORD, CALIF.
8 PAGES, 6 TABLES, 11 REFERENCES, MATERIALS EVALUATION 25(4), PAGES 83-90 (APRIL 1967)

PRESENTS A GENERAL REVIEW OF THE METHODS AND CRITERIA FOR ESTABLISHING RADIATION SAFETY PROCEDURES IN INDUSTRIAL X-RAY AND GAMMA-RAY RADIOGRAPHY PROGRAMS. THE USE AND IMPORTANCE OF THE HAZARDS ANALYSIS IS DISCUSSED IN RELATION TO THREE TYPES OF INSTALLATIONS. CURRENT THINKING REGARDING THE HEALTH OF RADIATION WORKERS AND THE MAXIMUM PERMISSIBLE DOSE ARE REVIEWED.

DOSE + MPD + RADIATION SAFETY AND CONTROL + *X-RAY + GAMMA + UNITED STATES

21137
GREEN FL
USES AND SAFETY ASPECTS OF THE LOW-ENERGY SOURCE YB-169
VISO CORP., BURLINGTON, MASS.
5 PAGES, 1 TABLE, 3 FIGURES, 6 REFERENCES, AMERICAN INDUSTRIAL HYGIENE ASSOCIATION JOURNAL, 27, PAGES 444-448 (SEPT. OCT. 1966)

THE RADIOACTIVE SOURCE YTTERBIUM-169 EMITS A 52-KEV CHARACTERISTIC XRAY AND VARIOUS GAMMA RAYS WITH ENERGIES FROM 65 KEV TO 310 KEV. YTTERBIUM SOURCES IN SMALL EXPOSURE UNITS WEIGHING ABOUT 20 POUNDS ARE USEFUL FOR RADIOGRAPHY OF CASTINGS, WELDMENTS, ASSEMBLIES, AND OTHER FORMS OF VARIOUS MATERIALS, SUCH AS ALUMINUM, MAGNESIUM, IRON, PLASTICS, AND WOOD. RADIOGRAPHY WITH YB-169 PRODUCES NO HAZARD FROM ELECTRICAL SHOCK OR EXPLOSION. RADIATION SCATTERED FROM AIR, THE OBJECT, AND SURROUNDING MATERIALS IS LESS WITH YB-169 THAN WITH CONVENTIONAL X-RAY SOURCES, IR-192, OR CO-60. THEREFORE, PORTABLE RADIOGRAPHIC APPLICATIONS CAN BE MADE WITH LESS DIFFICULTY IN PROTECTION OF PERSONNEL.

SOURCE, RADIATION + *X-RAY + GAMMA + YTTERBIUM

33312
COURSE ON RADIATION PROTECTION IN INDUSTRY
NP-17447 +. 266 PAGES, OCCUPATIONAL SAFETY AND HEALTH SERIES NO. 11, 1967

TOPICS DISCUSSED IN THIS TEXTBOOK FOR INDUSTRIAL SAFETY PERSONNEL INCLUDE THE FOLLOWING - BASIC PHENOMENA OF RADIATION AND RADIOACTIVITY, RADIATION DOSE UNITS (THEIR DETECTION AND MEASUREMENT), PRODUCTION OF RADIOISOTOPES AND X RAYS, MEDICAL USES OF RADIATION, RADIATION SHIELDING, INDUSTRIAL RADIOGRAPHY USING RADIOISOTOPES, ETC.

*ADMINISTRATIVE CONTROL + DOSE + *HEALTH PHYSICS TRAINING + INSTRUMENT, RADIATION MONITORING + *MEASUREMENT + HAZARD, RELATIVE + RADIATION UNIT + RADIATION PROTECTION, ORGANIZATION + *WASTE MANAGEMENT + ICRP + *RADIATION SAFETY AND CONTROL + RADIOISOTOPE + SHIELDING + RADIOLOGICAL ASSISTANCE + X-RAY + SAFETY PROGRAM + RADIOBIOLOGY

32131
KODAK ADOPTS DISCOVERY TECHNIQUE TO TEACH INDUSTRIAL RADIOGRAPHY
3 PAGES, MATERIALS EVALUATION, XXVI(3), MARCH 1968

ATLANTA, GA., SCHOOL GIVES 2-WEEK COURSES FOR CERTIFICATION UNDER AMERICAN SOCIETY FOR NONDESTRUCTIVE TESTING PROGRAM. ARTICLE DESCRIBES TRAINING DEVICES. *** BROCHURE AVAILABLE FROM EASTMAN KODAK (ROCHESTER, N.Y.) LISTS COURSES (ABOUT EVERY OTHER 3 WEEKS). LIMITED TO 16 PERSONS, \$300 EACH.

HEALTH PHYSICS TRAINING + *TRAINING

44742
GILBERTSON JD + FINGERHUT AG
STANDARDIZATION OF DIAGNOSTIC X-RAY GENERATORS

44742 *CONTINUED*
 4 PAGES, 7 FIGURES, 6 REFERENCES, RADIOLOGY, VOL. 93, PP. 1033-1036 (JULY 1969)

ACCURATE KNOWLEDGE OF KILOVOLTAGE AND MILLIAMPERAGE AS WELL AS OF EXPOSURE TIME IS ESSENTIAL TO THE PRODUCTION OF OPTIMAL QUALITY RADIOGRAPHS, BUT APPLICATION OF THESE SUPPOSEDLY IDENTICAL FACTORS TO DIFFERENT MACHINES OFTEN PRODUCES RADIOGRAPHS THAT ARE NOT COMPARABLE. A RELATIVELY SIMPLE METHOD WAS DEvised, WHICH WHEN APPLIED TO THE MACHINES REVEALED SIGNIFICANT ERRORS IN THE INDICATED KILOVOLTAGE PEAK AND MILLIAMPERAGE VALUES.

*X-RAY + *INSTRUMENT CALIBRATION + CODES AND STANDARDS + BIOMEDICAL + *RADIATION SAFETY AND CONTROL + RADIATION EXPOSURE

63479
 SHARPE RS
 RESEARCH TECHNIQUES IN NONDESTRUCTIVE TESTING
 1 PAGE, CEBR DIGEST, 23(2), PAGE 15, NO. 259 (FEBRUARY 1971), LONDON, ACADEMIC PRESS, 1970

THIS BOOK CONTAINS CONTRIBUTED REVIEW OF THE CURRENT SCIENTIFIC UNDERSTANDING OF THE TECHNIQUES DESCRIBED. CHAPTERS COVER ACOUSTIC EMISSION, ULTRASONIC SPECTROSCOPY, ULTRASOUND IMAGING SYSTEMS, ULTRASONIC CRITICAL ANGLE REFLECTIVITY, ULTRASONIC HOLOGRAPHY, OPTICAL HOLOGRAPHY AND COHERENT LIGHT TECHNIQUES, DATA-HANDLING TECHNIQUES, DIRECT-VIEW RADIOLOGICAL SYSTEMS, NEUTRON RADIOGRAPHY, SUBMILLIMETRIC WAVE TECHNIQUES, MULTIPARAMETER EDDY CURRENT CONCEPTS, PULSED EDDY CURRENTS, MICROWAVE TECHNIQUES, INFRARED TECHNIQUES.

*TEST, NONDESTRUCTIVE + REVIEW + ACOUSTICS + ULTRASONICS

66490
 PRUMMER RA
 BASIC PRINCIPLES AND APPLICATIONS OF X-RAY ANALYSIS OF RESIDUAL STRESSES
 10 PAGES, 14 FIGURES, KERNTECHNIK, 13(2), PP. 68-77 (1971)

PRINCIPLES OF X-RAY STRESS ANALYSIS ARE OUTLINED. THE FILM AND THE DIFFRACTOMETER METHODS ARE DESCRIBED AND THEIR ADVANTAGES AND DISADVANTAGES ARE DISCUSSED. THE X-RAY ELASTIC CONSTANTS, DESCRIBING THE RELATIONSHIP BETWEEN LATTICE STRAINS AND STRESSES, AND DISCUSSED IN DETAIL. IN MEASUREMENTS ON FERRITE IN STEELS, THESE CONSTANTS ARE AFFECTED BY FOUR DIFFERENT FACTORS. APPLICATIONS OF X-RAY STRESS ANALYSIS ARE DISCUSSED ON EXAMPLES OF RESIDUAL STRESSES INDUCED BY HARDENING AND BY WELDING. IT IS SHOWN THAT IT IS POSSIBLE TO CARRY OUT X-RAY STRESS MEASUREMENTS AT HIGH TEMPERATURES.

*PRESSURE VESSEL + STRESS STRAIN DATA + *STRESS ANALYSIS + EXPERIMENT + *TEST, NONDESTRUCTIVE + *STEEL + *HEAT TREATMENT + *WELDING + *HIGH TEMPERATURE

THIS PAGE
WAS INTENTIONALLY
LEFT BLANK

A COLLECTION OF KEYWORDS IS USED TO DENOTE THE MAIN SAFETY RELATED POINTS COVERED IN EACH ARTICLE. THE FOLLOWING INDEX IS AN ALPHABETICAL LISTING OF THE KEYWORDS GIVING REFERENCES TO EACH ARTICLE WHICH WAS KEYED TO IT.

ACCELERATOR	25276 P 69	39655 P 65	63343 P 69		26395 P 53			
ACCIDENT, CONSEQUENCES	06910 P 69				DATA COLLECTION			
ACCIDENT, CRITICALITY	06910 P 69				61440 P 51			
ACCIDENT, NONREACTOR	14262 P 35				DESIGN STUDY			
ACCIDENT, TRANSPORTATION	06910 P 69				38947 P 69			
ACOUSTICS	63479 P 71				DIFFUSION			
ADMINISTRATIVE CONTROL	07994 P 29	07995 P 29	08018 P 29	14262 P 35	38956 P 64			
	26343 P 19	26351 P 39	30044 P 61	32285 P 53	DOSE			
	61438 P 23	06910 P 69	33312 P 70	63343 P 69	19491 P 70	33312 P 70		
ALPHA EMITTER	43067 P 63				DOSE CALCULATION, EXTERNAL		32281 P 17	
APPLICATION FOR AEC LICENSE	67380 P 68				16366 P 10	23362 P 55		
BEHAVIOR	04930 P 53				DOSE MEASUREMENT, EXTERNAL		43249 P 34	
BERYLLIUM	35264 P 17				16366 P 10	38077 P 14		
BETA RAY	66200 P 65				DOSIMETRY, PHOTOGRAPHIC			
BIOMEDICAL	44742 P 70				43067 P 63			
BROWNS FERRY 1 (BWR)	31568 P 50				ELECTRICAL CONDUCTION			
BROWNS FERRY 3 (BWR)	31568 P 50				04799 P 15			
CABLES AND CONNECTORS	65441 P 44				ELECTRON MICROSCOPY			
CANADA	32427 P 60	35472 P 60	35473 P 61	17445 P 64	38956 P 64			
	18006 P 63	18008 P 64	61955 P 63		EMERGENCY PROCEDURE			
CARBON	63800 P 53	65435 P 31			28851 P 21	31545 P 52	63358 P 18	
CERAMICS	43067 P 63	65868 P 63			EQUIPMENT			
CERTIFICATION	32287 P 13	34865 P 16	60005 P 50		40440 P 20	46452 P 67	61723 P 67	
CESIUM	35264 P 17	48874 P 54	57040 P 61	63794 P 11	EXAMINATION			
	63796 P 43				16047 P 64	16053 P 66	46452 P 67	61723 P 67
CLADDING	16047 P 64				EXPERIMENT			
COATED PARTICLE	16047 P 64	38956 P 64			66490 P 71			
COATING	16047 P 64				EXPLOSION			
COBALT	12305 P 10	29810 P 32	30045 P 54	34867 P 56	25276 P 69			
	35183 P 18	35260 P 14	40442 P 24	42879 P 19	FABRICATION			
	47207 P 11	60002 P 10	63682 P 60	65446 P 28	31568 P 50	16047 P 64	16053 P 66	
CODES AND STANDARDS	44742 P 70	63343 P 69			FAILURE, ADMINISTRATIVE CONTROL			
COLLEGES AND UNIVERSITIES	61441 P 61	61443 P 53	63792 P 54		00551 P 18	00598 P 25	08669 P 30	10621 P 60
COMMUNICATION SYSTEM	31542 P 50				11789 P 46	11946 P 21	13999 P 49	16327 P 54
COMPARISON, THEORY AND EXPERIENCE	56330 P 66				16659 P 46	17117 P 9	24820 P 36	25347 P 9
CONSTRUCTION PERMIT PROCESS	31568 P 50				25632 P 45	26310 P 58	26312 P 19	26313 P 27
CONTAINMENT CONSTRUCTION	31568 P 50				26314 P 45	26321 P 24	26324 P 38	26325 P 36
CONTAINMENT LEAK MONITOR	33072 P 69				26328 P 46	26330 P 57	26335 P 49	26336 P 49
CONTAINMENT STRUCTURE	31568 P 50				26337 P 48	26338 P 46	26341 P 30	26353 P 38
CONTAINMENT, SOURCE	35258 P 16				26355 P 37	26356 P 37	26357 P 36	26358 P 36
CONTAMINATION	26362 P 31	26385 P 50	26395 P 53	29856 P 57	26366 P 37	26376 P 39	26384 P 59	26385 P 50
	35258 P 16	59935 P 43	25276 P 69	31356 P 67	26387 P 50	26394 P 48	29810 P 32	31542 P 50
CONTROL SYSTEM	11612 P 55	34865 P 16	42025 P 33		31545 P 52	31568 P 50	32280 P 26	32285 P 53
CORROSION	26385 P 49	16053 P 66			32288 P 14	32427 P 60	34865 P 16	35259 P 14
DAMAGE					35260 P 14	35472 P 60	35473 P 61	38077 P 14
					40440 P 20	40968 P 42	41529 P 42	41568 P 14
					41569 P 13	41626 P 31	42979 P 19	47187 P 25
					48191 P 9	48236 P 17	56967 P 10	57040 P 61
					57399 P 27	59284 P 27	60005 P 50	60008 P 23
					60843 P 34	61909 P 12	63795 P 59	63800 P 53
					64308 P 43	18006 P 63	60868 P 68	
					FAILURE, CLADDING			
					40267 P 64			
					FAILURE, COMPONENT			
					09280 P 9			
					FAILURE, DESIGN ERROR			
					09562 P 51	16366 P 10		
					FAILURE, EQUIPMENT			
					04799 P 15	08066 P 32	08669 P 30	10869 P 58
					11612 P 55	16327 P 54	16370 P 59	17372 P 33
					24206 P 52	26327 P 58	26331 P 56	26338 P 46
					26348 P 47	26380 P 55	26381 P 56	26382 P 55
					26385 P 50	26392 P 38	28851 P 21	31543 P 20
					31546 P 52	32286 P 52	34865 P 16	40968 P 42
					41566 P 18	42008 P 45	42025 P 33	48238 P 19
					48874 P 54	57398 P 58	57462 P 24	57463 P 45
					57466 P 30	59281 P 58	59935 P 43	61442 P 17
					61443 P 53	61900 P 34	61907 P 23	62750 P 12
					63693 P 35	63796 P 43	65435 P 31	65441 P 44
					65442 P 56			
					FAILURE, FUEL ELEMENT			
					40267 P 64			
					FAILURE, INSTRUMENT			
					10196 P 23	16658 P 44	26342 P 20	35259 P 14
					35260 P 14	36285 P 22	56076 P 29	
					FAILURE, MAINTENANCE ERROR			
					15080 P 19			
					FAILURE, OPERATOR ERROR			
					00551 P 18	00715 P 34	04799 P 15	04930 P 53
					07994 P 29	07995 P 29	08018 P 29	09193 P 40
					09277 P 52	09278 P 30	09280 P 9	09295 P 40
					09562 P 51	11946 P 21	12305 P 10	13999 P 49

15079 P 19	16366 P 10	16658 P 44	16761 P 61	26351 P 39	26352 P 39	26360 P 32	26361 P 32
17122 P 46	17372 P 33	18388 P 13	23362 P 55	26364 P 30	26367 P 28	26371 P 20	26372 P 15
25348 P 16	25632 P 45	26309 P 11	26310 P 58	26380 P 55	26381 P 56	26382 P 55	26383 P 57
26311 P 54	26319 P 20	26324 P 38	26325 P 36	26386 P 51	26388 P 59	26389 P 49	26391 P 48
26327 P 58	26330 P 57	26333 P 31	26337 P 48	26392 P 38	29810 P 32	30044 P 61	40442 P 24
26338 P 46	26340 P 57	26342 P 20	26344 P 48	40444 P 16	41528 P 41	41532 P 41	41534 P 22
26351 P 39	26353 P 38	26355 P 37	26356 P 37	44909 P 42	65446 P 28	22826 P 68	22827 P 66
26357 P 36	26358 P 36	26366 P 37	26381 P 56	INCIDENT, NONNUCLEAR			
26382 P 55	26383 P 57	26384 P 59	26387 P 50	11612 P 55	25276 P 69		
26395 P 53	27898 P 41	28850 P 37	28851 P 21	INCIDENT, NONREACTOR			
30044 P 61	31542 P 50	31543 P 20	32281 P 17	06917 P 44	06920 P 28	07994 P 29	07995 P 29
32287 P 13	32427 P 60	34865 P 16	35259 P 14	08669 P 30	16327 P 54	24206 P 52	26305 P 24
35264 P 17	36284 P 22	36285 P 22	37498 P 23	26306 P 24	26307 P 9	26308 P 21	26309 P 11
40442 P 24	40444 P 16	40445 P 12	40747 P 15	26319 P 20	26320 P 47	26326 P 21	26329 P 48
40968 P 42	41147 P 24	41528 P 41	41534 P 22	26330 P 57	26331 P 56	26333 P 31	26339 P 40
41566 P 18	41568 P 14	41646 P 41	42008 P 45	26340 P 57	26351 P 39	26352 P 39	26354 P 38
42025 P 33	43249 P 34	47158 P 44	47192 P 57	26360 P 32	26361 P 32	26362 P 31	26364 P 30
47194 P 33	47196 P 33	47207 P 11	48191 P 9	26367 P 28	26368 P 28	26370 P 26	26371 P 20
48236 P 17	48245 P 30	56046 P 42	56047 P 59	26372 P 15	26377 P 39	26380 P 55	26381 P 56
56967 P 10	57466 P 30	60000 P 25	60004 P 26	26382 P 55	26383 P 57	26386 P 51	26388 P 59
60008 P 23	60843 P 34	61902 P 51	61907 P 23	26389 P 49	26390 P 49	26391 P 48	26392 P 38
63638 P 51	63793 P 15	63794 P 11	63799 P 15	29810 P 32	65446 P 28	06910 P 69	25276 P 69
64641 P 10	65439 P 43	65440 P 26	65446 P 28	INCIDENT, RECOVERY FROM			
18008 P 64	22826 P 68	22827 P 66	25276 P 69	09280 P 9	16327 P 54	26330 P 57	26331 P 56
FAILURE, SEQUENTIAL				26359 P 32	26370 P 26	26373 P 13	26377 P 39
26380 P 55				31546 P 52	32286 P 52		
FAULT				INCINERATION			
04799 P 15				25276 P 69			
FILM				INDIUM			
56076 P 29				35260 P 14			
FIRE				INDUSTRIAL SAFETY			
26368 P 28	25276 P 69			25276 P 69	31356 P 67	38947 P 69	63343 P 69
FISSION PRODUCT ACTIVITY, GROSS				INFORMATION RETRIEVAL			
43067 P 63				59280 P 27	60008 P 23	22826 P 68	22827 P 66
FLAW				INSTRUMENT CALIBRATION			
56330 P 66	66200 P 65			26311 P 54	26313 P 27	26315 P 35	26316 P 35
FUEL ELEMENT				26341 P 30	60008 P 23	61438 P 23	61909 P 12
16053 P 66	65868 P 63			44742 P 70			
FUEL INTEGRITY				INSTRUMENT, ABNORMAL INDICATION			
16053 P 66	38956 P 64			56076 P 29			
FUEL MELTDOWN				INSTRUMENT, COMPONENT			
25276 P 69	40267 P 64			38947 P 69			
GAMMA				INSTRUMENT, DETECTION FAILED FUEL ELEMENT			
19491 P 70	21137 P 70			56330 P 66			
GAMMA EMITTER				INSTRUMENT, FUEL SCANNING			
35183 P 18				16047 P 64			
GENERATOR, BATTERY				INSTRUMENT, INTERLOCK			
57466 P 30				16658 P 44	35183 P 18		
GUIDE				INSTRUMENT, NUCLEAR			
63343 P 69	63343 P 69	67380 P 68		38947 P 69			
HAZARD, RELATIVE				INSTRUMENT, POSITION			
33312 P 70	63343 P 69			15080 P 19			
HEALTH PHYSICS TRAINING				INSTRUMENT, RADIATION MONITORING			
06920 P 28	31542 P 50	35259 P 14	35260 P 14	26315 P 35	26316 P 35	26317 P 35	26318 P 36
36285 P 22	36290 P 22	16197 P 63	32131 P 70	26342 P 20	26343 P 19	44909 P 42	33072 P 69
33312 P 70				33312 P 70			
HEAT TREATMENT				IRIDIUM			
66490 P 71				04930 P 93	10869 P 58	29702 P 11	29856 P 57
HELIUM				35258 P 16	36283 P 22	36284 P 22	36285 P 22
33072 P 69				37498 P 23	38077 P 14	40743 P 37	40747 P 15
HIGH TEMPERATURE				40968 P 42	42025 P 33	47158 P 44	47192 P 57
66490 P 71				47194 P 33	47196 P 33	48191 P 9	59935 P 43
HOT CELL				63638 P 51	63682 P 60	64641 P 10	65441 P 44
34865 P 16				65442 P 56			
ICRP				IRRADIATION TESTING			
33312 P 70				65868 P 63			
INCIDENT				LAMPRE 1 (RE)			
17372 P 33	40483 P 56	06910 P 69	17445 P 64	16047 P 64			
18006 P 63	18008 P 64			LAPRE 1 AND 2 (RE)			
INCIDENT COMPILATION				16047 P 64			
06910 P 69	11971 P 68	18006 P 63	25276 P 69	LASL			
31356 P 67	32290 P 65			16047 P 64			
INCIDENT, EQUIPMENT				LEAK			
06917 P 44	08066 P 32	11612 P 55	15080 P 19	29702 P 11	35258 P 16	57398 P 58	59281 P 58
16370 P 59	26307 P 9	26354 P 38	26359 P 32	59935 P 43	60002 P 10	61441 P 61	61443 P 53
26363 P 31	26369 P 27	26373 P 13	28850 P 37	61908 P 25	63796 P 43	65435 P 31	65442 P 56
INCIDENT, EXPOSURE				33072 P 69			
28851 P 21	31543 P 20	31545 P 52	31546 P 52	LEAK RATE			
32280 P 26	32281 P 17	32287 P 13	32413 P 21	33072 P 69			
34867 P 56	36283 P 22	36284 P 22	40442 P 24	LICENSE STATUS			
40444 P 16	40483 P 56	40968 P 42	41528 P 41	35472 P 60	35473 P 61	63799 P 15	
41525 P 42	41533 P 41	41534 P 22	41566 P 18	MAINTENANCE AND REPAIR			
41569 P 13	61907 P 23	65446 P 28	31356 P 67	15080 P 19	16761 P 61	18388 P 13	57462 P 24
INCIDENT, FATALITY				57463 P 45	18006 P 63	46452 P 67	61723 P 67
25276 P 69				MEASUREMENT			
INCIDENT, HUMAN ERROR				16047 P 64			
06920 P 28	07994 P 29	07995 P 29	09562 P 51	METAL			
11789 P 46	11946 P 21	12305 P 10	13999 P 49	16047 P 64			
14262 P 35	15079 P 19	16327 P 54	16366 P 10	MODIFICATION			
18388 P 13	26306 P 24	26309 P 11	26326 P 21	08066 P 32	40440 P 20	64642 P 12	
26329 P 48	26330 P 57	26331 P 56	26344 P 48	MONITOR, AREA			

18388 P 13	26318 P 36	26324 P 38	26343 P 19	RADIATION EXPOSURE, FRACTIONAL			
34865 P 16	35183 P 18			63793 P 15			
MONITOR, PERSONNEL				RADIATION EXPOSURE, RECORD KEEPING			
00551 P 18	00715 P 34	13999 P 49	16658 P 44	00551 P 18	00598 P 25	35472 P 60	35473 P 61
26311 P 54	26336 P 49	26342 P 20	26367 P 28	40741 P 38	40743 P 37	43249 P 34	56967 P 10
30045 P 54	43249 P 34	47205 P 11	48244 P 42	59936 P 11	59949 P 25	60008 P 23	60843 P 34
56947 P 59	56076 P 29	61901 P 34	61902 P 51	63358 P 18	64642 P 12		
61908 P 25	61909 P 12	63793 P 15	63799 P 15	RADIATION PROTECTION, ORGANIZATION			
MONITORING SYSTEM, RADIATION				33312 P 70			
56967 P 10	57466 P 30	59284 P 27		RADIATION SAFETY AND CONTROL			
MPD				00598 P 25	06917 P 44	06918 P 39	06920 P 28
19491 P 70				07994 P 29	07995 P 29	16658 P 44	16761 P 61
NEUTRON				26312 P 19	26313 P 27	26324 P 38	26328 P 46
39655 P 65	40267 P 64			26343 P 19	26351 P 39	26356 P 37	26377 P 39
NICKEL				26380 P 55	26385 P 50	26307 P 50	26394 P 48
60004 P 26				29810 P 32	31545 P 52	32281 P 17	32285 P 53
NRTS				32287 P 13	32288 P 14	32427 P 60	35472 P 60
16053 P 66				35473 P 61	40444 P 16	40445 P 12	40743 P 37
OCEAN AND SEA				41529 P 42	41626 P 31	56967 P 10	59280 P 27
26306 P 24	26323 P 47	26346 P 47	26349 P 46	59284 P 27	59936 P 11	61438 P 23	61908 P 25
OPERATING EXPERIENCE				61909 P 12	63795 P 59	06910 P 69	16197 P 63
07994 P 29	40445 P 12	41528 P 41	41532 P 41	17187 P 66	19491 P 70	22825 P 67	22826 P 68
41534 P 72	62750 P 12	63799 P 15	63800 P 53	22827 P 66	33072 P 69	33312 P 70	44742 P 70
OPERATING EXPERIENCE SUMMARY				63343 P 69			
07995 P 29	10196 P 23			RADIATION UNIT			
OPERATING LICENSE PROCESS				33312 P 70			
35472 P 60	35473 P 61			RADIATION, PUBLIC EDUCATION			
OPERATOR ACTION				26369 P 27			
04930 P 53	31543 P 20			RADIOBIOLOGY			
PERSONNEL EXPOSURE, RADIATION				33312 P 70			
00551 P 18	00598 P 25	00715 P 34	04799 P 15	RADIOCHEMICAL PROCESSING			
04930 P 53	06920 P 28	07994 P 29	07995 P 29	11971 P 68	60868 P 68		
08018 P 29	08066 P 32	08669 P 30	09193 P 40	RADIOISOTOPE			
09277 P 52	09278 P 30	09280 P 9	09295 P 40	35183 P 18	33312 P 70		
09562 P 51	10196 P 23	11946 P 21	12305 P 10	RADIOLOGICAL ASSISTANCE			
13999 P 49	14262 P 35	15079 P 19	15080 P 19	33312 P 70			
16327 P 54	16366 P 10	16658 P 44	16659 P 46	RADIOLOGY			
16761 P 61	17372 P 33	18388 P 13	23362 P 55	60868 P 68			
24206 P 52	25347 P 9	25348 P 16	26305 P 24	RADIUM			
26307 P 9	26308 P 21	26309 P 11	26311 P 54	35264 P 17	33072 P 69		
26319 P 20	26320 P 47	26324 P 38	26326 P 21	RADON			
26327 P 58	26329 P 48	26330 P 57	26331 P 56	33072 P 69			
26333 P 31	26337 P 48	26340 P 57	26351 P 39	REACTOR, AEC OWNED			
26352 P 39	26353 P 38	26354 P 38	26357 P 36	11971 P 68			
26359 P 32	26360 P 32	26361 P 32	26363 P 31	REACTOR, BWR			
26364 P 30	26367 P 28	26368 P 28	26371 P 20	32290 P 65			
26372 P 15	26377 P 39	26380 P 55	26381 P 56	REACTOR, FAST			
26382 P 55	26383 P 57	26386 P 51	26388 P 59	40267 P 64			
26389 P 49	26390 P 49	26391 P 48	26392 P 38	REACTOR, POWER			
28850 P 37	28851 P 21	30045 P 54	31542 P 50	25276 P 69	31356 P 67	60868 P 68	
31543 P 20	32281 P 17	32286 P 52	32287 P 13	REACTOR, PWR			
32413 P 21	34865 P 16	34867 P 56	35259 P 14	16761 P 61	32290 P 65		
35260 P 14	35264 P 17	36283 P 22	36285 P 22	REACTOR, RESEARCH			
37492 P 9	37498 P 23	38077 P 14	40442 P 24	31356 P 67	32290 P 65		
40444 P 16	40445 P 12	40483 P 56	40741 P 38	REACTOR, TEST			
40743 P 37	40747 P 15	40968 P 42	41147 P 24	25276 P 69			
41528 P 41	41529 P 42	41533 P 41	41534 P 22	RECORDS			
41566 P 18	41567 P 13	41569 P 13	41626 P 31	00551 P 18	56967 P 10	60005 P 50	60008 P 23
41646 P 41	42008 P 45	42025 P 33	43249 P 34	61908 P 25	61909 P 12		
47158 P 44	47187 P 25	47192 P 57	47194 P 33	REGULATION			
47196 P 33	47207 P 11	48236 P 17	48238 P 19	61955 P 63			
48244 P 42	48245 P 30	56046 P 42	56047 P 59	REGULATION, AEC			
56076 P 29	57042 P 28	57462 P 24	57463 P 45	13999 P 49	61908 P 25	08664 P 68	22825 P 67
57466 P 30	59284 P 27	60000 P 25	60843 P 34	46452 P 67	60868 P 68	61723 P 67	
61900 P 34	61901 P 34	61902 P 51	61907 P 23	REMOTE MANIPULATING AND VIEWING			
63358 P 18	63638 P 51	63682 P 60	63683 P 43	16327 P 54	30044 P 61	31546 P 52	43067 P 63
63693 P 35	63793 P 15	63799 P 15	64098 P 40	REVIEW			
64641 P 10	64642 P 12	65439 P 43	65440 P 26	38947 P 69	63479 P 71		
65441 P 44	65446 P 28	11971 P 68	17445 P 64	RIVER			
18008 P 64	22826 P 68	22827 P 66	25276 P 69	26370 P 26			
31356 P 67				SAFETY DEVICE			
PERSONNEL PROTECTIVE DEVICE				34867 P 56			
10196 P 23	25348 P 16	26315 P 35	26316 P 35	SAFETY EVALUATION			
26317 P 35	26318 P 36	26342 P 20	30044 P 61	38947 P 69			
32280 P 26	32281 P 17	32427 P 60	35183 P 18	SAFETY PRINCIPLES AND PHILOSOPHY			
35260 P 14	36284 P 27	61902 P 51		16197 P 63	18006 P 63		
PLUTONIUM				SAFETY PROGRAM			
43067 P 63				33312 P 70			
PRESSURE VESSEL				SAFETY REVIEW			
66200 P 65	66440 P 71			07994 P 29	07995 P 29	32287 P 13	08664 P 68
PROCEDURES AND MANUALS				SHIELDING			
00715 P 34	35183 P 18	41646 P 41	63799 P 15	31546 P 52	34867 P 56	37492 P 9	37498 P 23
63800 P 53	16197 P 63	18006 P 63		33312 P 70			
PRTR (TRI)				SHIPPING CONTAINER			
25276 P 69				59935 P 43			
PYROLYTIC				SHIPPINGPORT (PWR)			
38956 P 64				16761 P 61			
QUALITY ASSURANCE				SOURCE MECHANISM			
31568 P 50	35258 P 16	16047 P 64	16053 P 66	63793 P 15			
RADIATION EXPOSURE				SOURCE, NEUTRON			
00715 P 34	44742 P 70			35264 P 17			

SOURCE, RADIATION

00598 P 25	00715 P 34	04930 P 53	06917 P 44
06918 P 39	06920 P 28	08018 P 29	08066 P 32
08669 P 30	14262 P 35	16327 P 54	16370 P 59
17117 P 9	24206 P 52	26305 P 24	26312 P 19
26313 P 27	26314 P 45	26319 P 20	26321 P 24
26324 P 38	26326 P 21	26327 P 58	26329 P 48
26333 P 31	26335 P 49	26336 P 49	26338 P 46
26343 P 19	26352 P 39	26353 P 38	26359 P 32
26360 P 32	26361 P 32	26362 P 31	26363 P 31
26364 P 30	26367 P 28	26368 P 28	26369 P 27
26371 P 20	26372 P 15	26373 P 13	26377 P 39
26385 P 50	26386 P 51	26388 P 59	26389 P 49
26391 P 48	26392 P 38	26395 P 53	29702 P 11
29856 P 57	31546 P 52	35183 P 18	35258 P 16
35264 P 17	36285 P 22	40444 P 16	40968 P 42
41646 P 41	42879 P 19	56046 P 42	56047 P 59
57398 P 58	57462 P 24	57463 P 45	57466 P 30
59280 P 27	59281 P 58	59284 P 27	59935 P 43
59949 P 25	60000 P 25	60002 P 10	60004 P 26
60005 P 50	60008 P 23	60843 P 34	61438 P 23
61440 P 51	61441 P 61	61443 P 53	61907 P 23
61908 P 25	61909 P 12	62750 P 12	63682 P 60
63683 P 43	63693 P 35	63793 P 15	63796 P 43
64641 P 10	65435 P 31	65439 P 43	65440 P 26
65441 P 44	65442 P 56	06910 P 69	21137 P 70
33072 P 69			

SOURCE, RADIATION, LOST

06918 P 39	26306 P 24	26323 P 47	26339 P 40
26344 P 48	26345 P 47	26346 P 47	26347 P 47
26348 P 47	26349 P 46	26370 P 26	26394 P 48
29810 P 32	32634 P 17	41532 P 41	44909 P 42
57040 P 61	61442 P 17	63792 P 54	63794 P 11

SPECIAL NUCLEAR MATERIAL

35264 P 17

STAFFING

35472 P 60	35473 P 61	59936 P 11	60005 P 50
------------	------------	------------	------------

STEEL

66200 P 65	66490 P 71
------------	------------

STORAGE CONTAINER

17122 P 46	26313 P 27	26335 P 49	26336 P 49
26338 P 46	26343 P 19	26353 P 38	

STRESS ANALYSIS

66490 P 71

STRESS STRAIN DATA

66490 P 71

STRONTIUM

44909 P 42

SURFACE CONTAMINATION

59935 P 43 60002 P 10

SURVEILLANCE PROGRAM

46452 P 67

SURVEY

32287 P 13

SURVEY, RADIATION

04930 P 53	17117 P 9	26355 P 37	26360 P 32
26361 P 32	26364 P 30	31542 P 50	31543 P 20
32280 P 26	32281 P 17	32427 P 60	36284 P 22
36285 P 22	36290 P 22	41534 P 22	41646 P 41
56967 P 10	57466 P 30	59284 P 27	60000 P 25
60008 P 23	60843 P 34	64642 P 12	

SYSTEM DESCRIPTION

66517 P 65

TECHNICAL SPECIFICATIONS

60868 P 68

TEST, INSTRUMENT RESPONSE

38947 P 69

TEST, LEAK

61909 P 12

TEST, LEAK LOCATION

17117 P 9

TEST, LEAK RATE

35258 P 16

TEST, NONDESTRUCTIVE

31568 P 50	16047 P 64	16053 P 66	39655 P 65
40267 P 64	63479 P 71	66200 P 65	66490 P 71
66517 P 65	67395 P 65		

TEST, PRESSURE VESSEL

31568 P 50

TEST, PROOF

16047 P 64

TEST, SYSTEM OPERABILITY

62750 P 12

TESTING

59949 P 25	61438 P 23	61440 P 51	16047 P 64
16053 P 66	33072 P 69		

THICKNESS

66200 P 65

TRACER, RADIOACTIVE

17187 P 66

TRAINING

06920 P 28	07994 P 29	07995 P 29	26312 P 19
26324 P 38	26325 P 36	26327 P 58	26356 P 37
26376 P 39	31543 P 20	32281 P 17	32288 P 14
32427 P 60	36285 P 22	36290 P 22	40968 P 42
47205 P 11	59280 P 27	59284 P 27	59949 P 25
60005 P 50	63793 P 15	63799 P 15	16197 P 63
17187 P 66	18006 P 63	27334 P 67	32131 P 70
67395 P 65			

TRANSPORTATION AND HANDLING

26368 P 28

UHTREX (GCR)

16047 P 64

ULTRASONICS

63479 P 71 66517 P 65 67395 P 65

UNITED STATES

19491 P 70

WASTE DISPOSAL, OCEAN

06918 P 39

WASTE MANAGEMENT

33312 P 70

WELDING

16761 P 61 66490 P 71

WELDS

16053 P 66 56330 P 66

X-RAY

04799 P 15	11612 P 56	25348 P 16	35257 P 14
37492 P 9	40483 P 56	61900 P 34	17445 P 64
19491 P 70	21137 P 70	31356 P 67	33312 P 70
38956 P 64	44742 P 70	56330 P 66	63343 P 69

YTTERBIUM

21137 P 70

FOLLOWING IS A LIST OF AUTHORS WHOSE DOCUMENTS
HAVE BEEN ABSTRACTED IN THIS PUBLICATION

BESSMER DJ		HEFFAN H	
29762 P 11		19491 P 70	
BIRD PM		HIRSCHBERG SM	
17445 P 64		28851 P 21	
BOSTROM NA		IODINGS FA	
39655 P 65		39655 P 65	
BROWN ES		IRIE K	
16053 P 66		66200 P 65	
BURDICK EE		JUPPENLATS JW	
16053 P 66		06917 P 44	
CARTER WP		LARTY JE	
30045 P 54		12305 P 10	
CASE OP		LENT F	
56330 P 66		07995 P 29	
CLIFFORD FL		MCCLUNG RW	
11946 P 21	23362 P 55	66517 P 65	
CLUSS RD		MCCUE JK	
26381 P 56		09280 P 9	
COPPOLA SA		MCGUFFEY JR	
63343 P 69		67395 P 65	
CRAMER EN		MOBERG AJ	
32290 P 65		08066 P 32	29810 P 32
CRISCUGLO EL		MOORE TM	
56330 P 66		63343 P 69	
DASGUPTA AK		MULLIKIN MS	
18006 P 63	18008 P 64	09277 P 52	09562 P 51 24206 P 52
DYER CH		MYERS DL	
56330 P 66		08669 P 30	
FARY EJ		ONEIL RW	
26382 P 55		26309 P 11	
FINGERHUT AG		PRUMMER RA	
44742 P 70		66490 P 71	
FLETCHER FR		SCHROEDER AW	
25348 P 16		24820 P 36	
FRANCIS WC		SHARPE RS	
16053 P 66		63479 P 71	
FUJITA H		SHIELDS RR	
66200 P 65		16370 P 59	
GIBSON GW		STEWART KP	
16053 P 66		38956 P 64	
GILBERTSON JD		SYLVESTER JG	
44742 P 70		06920 P 28	
GOSH SK		TENNEY GH	
18008 P 64		16047 P 64	
GREEN FL		TINGEY FH	
21137 P 70		16053 P 66	
GRUBER WJ		TOWLE LH	
43067 P 63	65868 P 63	17187 P 66	
GUNDAKER WE		WEISNER WJ	
63343 P 69		28850 P 37	
HASKINS J		WINTERS WR	
40267 P 64		07994 P 29	09278 P 30
HAYES DF		WOOD VA	
06910 P 69		33072 P 69	

NUCLEAR SAFETY

A BIMONTHLY REVIEW JOURNAL PREPARED BY NSIC

Nuclear Safety covers significant developments in the field of nuclear safety.

The scope is limited to topics relevant to the analysis and control of hazards associated with nuclear reactors, operations involving fissionable materials, and the products of nuclear fission.

Primary emphasis is on safety in reactor design, construction, and operation; however, safety considerations in reactor fuel fabrication, spent-fuel processing, nuclear waste disposal, handling of radioisotopes, and related operations are also treated.

Qualified authors are invited to submit interpretive articles, which will be reviewed for technical accuracy and pertinency. Authors will be advised as soon as possible of acceptance or suggested changes. Send inquiries or 3 copies of manuscripts (with the draftsman's original line drawings plus 2 copies, and with continuous-tone glossy prints of photographs plus 2 copies) to J. P. Blakely, Oak Ridge National Laboratory, P. O. Box Y, Oak Ridge, Tennessee 37830.

Nuclear Safety is prepared by the Nuclear Safety Information Center at Oak Ridge National Laboratory for the U.S. Atomic Energy Commission, Division of Technical Information. For subscriptions, address Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402. The subscription rate is \$3.50 per year. Below is an order blank for your convenience.

U. S. GOVERNMENT PRINTING OFFICE
DIVISION OF PUBLIC DOCUMENTS
WASHINGTON, D. C. 20402

OFFICIAL BUSINESS

RETURN AFTER 5 DAYS

Name _____
Street _____
City _____ State _____ ZIP _____

POSTAGE AND FEES PAID
U. S. GOVERNMENT PRINTING OFFICE

To Ensure Prompt, Accurate Shipment, Please Print or Type Address on Mailing Label Above

MAIL ORDER FORM TO:

Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402

Enclosed find \$ _____ (check, money order, or Superintendent of Documents coupons).

Please send me _____ subscriptions to *Nuclear Safety* at
\$3.50 per subscription. (Single issues are sold at \$0.60 per issue.)

Please charge this order _____ Name _____
to my Deposit Account _____ Street _____
No. _____ City _____ State _____ ZIP _____

FOR USE OF SUPT. DOCS.

Enclosed _____
To be mailed _____
later _____
Subscription _____
Refund _____
Coupon refund _____
Postage _____

POSTAGE AND REMITTANCE: Postpaid within the United States, Canada, Mexico, and all Central and South American countries except Argentina, Brazil, Guyana, French Guiana, Surinam, and British Honduras. For these and all other countries, add \$1.00 for each annual subscription; for a single issue, add one-fourth of the single-issue price. Payment should be by check, money order, or document coupons, and **MUST** accompany order. Remittances from foreign countries should be made by international money order or draft on an American bank payable to the Superintendent of Documents or by UNESCO book coupons.