U. S. ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE
INSPECTION DIVISION

By : John R. Sears, New York Operations Office

Title: ORDNANCE MATERIALS RESEARCH REACTOR

SUMMARY

The Ordnance Materials Research Reactor at Watertown, Massachusetts, was visited on June 13 thru 16, 1960 by John R. Sears, Inspection Division, NYOO.

The purpose of the visit was to conduct a pre-operational inspection of the Ordnance Materials Research Reactor, a one megawat swimming pool type reactor. At the conclusion of the pre-operational inspection, a recommendation was made that a license be issued for the operation of this facility.

The OMRO's reactor contractor, the Curtiss-Wright Corporation, had employed skin diving techniques during the pre-operational checkout. The operating license was issued, however, with the understanding that no skin diving would be employed in the reactor without prior written permission from the Commission. The initial start-up of this reactor was witnessed. Some faults in good operating procedure were noted. During the initial loading, conventional tools were employed to place the fuel elements in the core. The Curtiss-Wright representatives have requested the licensee, that is, the OMRO people, to obtain an amendment to the license so that they will be allowed to use skin diving techniques during the initial low power tests of this reactor.

Reviewed by: ______________________
Robert W. Kirkman, Director
Inspection Division

Period of Inquiry: June 13 thru 16, 1960

DETAILS

I. Scope of Inspection

The OMRO Research Reactor was visited on June 13 thru 16, 1960, by John R. Sears, Inspection Division, NYOO. Major Rudolf Staffa, Chief Health & Safety Branch, Nuclear Power Division, of the Office of the Chief of Engineers, U. S. Army, accompanied the inspector. Major Staffa was present during the inspection of the physical plant on the morning of June 13. He was not present during the instrumentation check out or simulated operation or the subsequent start-up of the reactor.

Dr. Robert Cochran of Texas A & M was present during the pre-operational inspection and during the initial phases of the start-up of the reactor. Dr. Cochran is employed as a consultant to the OMRO.

During the inspection, the following personnel were contacted:

OMRO Personnel
John O'Connor, Chief Nuclear Reactor Facility
Richard N. Stanton, Reactor Engineer
Charles E. Dady, Radiological Safety Officer
Joseph Vella, Reactor Operator Technician
Robert March, Reactor Operator Technician
Thomas Jenkins, Reactor Operator Technician

Curtiss-Wright Corporation
William Hall, Operations Supervisor
Peer Neilsen, Project Manager
Howard Aderholt, Instrument Technician

The inspection included a physical inspection of the complete reactor facility, review of initial start-up procedures, administrative controls, and normal operating procedures. The inspection also included the witnessing of the initial loading to criticality of this reactor.

A. General Description of Reactor

1. The OMRO reactor is a one megawatt swimming pool reactor designed to support a program which uses emergent neutron beam for basic research in solid state investigations. The reactor shield incorporates an annular well which surrounds the octagon shaped reactor pool. There is a gate, sealed by an inflatable gasket, between the pool and the well. It is proposed to store discharged fuel elements and discharged irradiated capsules in this well. The reactor is housed in a containment shell.

2. A visual inspection of the complete reactor facility was made and the following observations were noted. The containment building was complete. One airlock was in normal usage, the other airlock had its mechanical interlock bypassed during a repair to the controls on this interlock.

3. The main reactor coolant circulating pump, the heat exchanger, the ion exchange column with its pre and post filters were observed. All piping and valves on the main coolant system were stated by Mr. O'Connor to be of aluminum construction. A Tracerlab fission product monitor had been installed. This monitor receives a sample of the main cooling stream, checks it for radioactivity on a continuous basis and then discharges it back into the main coolant stream.

4. It was noted that the air compressor for the reactor building did not have carbon rings nor was it lubricated with synthetic oil. The advisability of using synthetic oil was pointed out to Mr. O'Connor.

5. The reactor has two pneumatic rabbit facilities. The operation of these was demonstrated by Mr. O'Connor. The tubes are under a vacuum constantly during all phases of operation. Air is sucked into the tubes and then discharged through a fan to the exhaust duct work of the main building ventilation system.

6. The reactor control rods were in place and a testing program had been completed on their operation. The ion chambers were in place. In addition, a fission chamber and a BF-3 counter had been installed in a horizontal beam port at approximately the center of the reactor. These chambers were then connected to scalers located on the pile top for the initial start-up of the reactor.

7. Dummy fuel elements had been installed in the grid plate to check clearances and tolerances.

8. Two handling tools were observed to be in the pool. A Curtiss-Wright engineer was skin diving in the pool to discharge the dummy fuel elements. Another engineer also attired in skin diving equipment was on the pile top observing.

9. It was noted that there was evidence of leakage of water thru the outside of the concrete shield. Mr. O'Connor said that they had eliminated the possibility that the water was leaking from the main pool by draining the annular well and observing that the leaks then stopped. It is the opinion of the inspector that these leaks from the annular well are not serious nor extensive. Mr. O'Connor stated that he intends seeing to it that his general contractor repairs the leaks in the annulus.

10. The liquid waste disposal facility was inspected. This includes three large hold-up tanks with inter-connecting piping and pumps, and a demineralizer with throw-away type cartridges. Mr. O'Connor stated that procedures for disposal of these cartridges and for replacement with new cartridges have not as yet been worked out. He stated further that the sampling valve and the final valve by which liquid waste may be discharged to the Metropolitan District Commission sewerage system will be furnished with locks.

Containment

The containment shell for the Ordnance Materials Research Reactor was stated to have been designed to maintain a leak rate of less than 1% of the shell volume per pound over pressure per day. The hazards summary report specified a maximum leak rate of 2% per pound over pressure per day.

Mr. O'Connor stated that in March, 1960, the Pittsburgh Des-Moines Steel Company, the erector of the containment shell conducted a test to demonstrate that the containment shell would not exceed the design leak rate. The test employed a reference volume system inside the shell in order to eliminate any temperature or humidity effects during the test.

Pittsburgh Des-Moines issued a report on the containment test to OMRO. This report was reviewed by the inspector. The report states that the reference drum system was tested as 5 psig for a period of 24-hours to assure that there were no leaks in the reference system. The building itself was put on initial test on March 22, 1960, with the inner airlock doors closed and the outer airlock doors opened. A second test was completed on March 23, 1960, with the inner airlock doors opened and the outer airlock doors closed.

During the initial eight hours of each test, the outside temperature remained fairly constant and good agreement between the manometer difference and the containment shell pressure was obtained. With the inner airlock doors closed, the manometer difference in 8-hours was 1" of water which is equivalent to 0.1083 psi in 24-hours, or 0.32% of the building volume per pound over pressure per day.

With the outer airlock doors closed, the manometer difference in 8-hours was 0.38" of water which is equivalent to a leak of 0.28% of the building volume per pound over pressure per day.

It was noted that electrical penetrations through the sphere are accomplished simply by running the cables through a section of conduit, both ends of which are dammed with oakum and then this inside space is filled with a sealing compound. No attempt has been made to seal the space between conductors within a cable in a multi-conductor cable. The leak rate obtained during the containment shell leak test then includes leaks which come through the cables at the low pressure at which this building was tested. There is evidently a relatively small amount of leakage thru the cables due to the large pressure drop.

Pipe lines containing liquid from the containment vessel are sealed by means of a 5' trap on the outside of the containment vessel. Intake and exhaust ducts on the main building ventilation system are equipped with quick closing valves which have neoprene liners for gas tightness. These quick closing valves are interlocked with a supply fan and also with a radiation signal coming from the stack monitor. The stack monitor consists of a gaseous detector and also a particulate detector of the moving filter paper type. Mr. O'Connor said that these detectors are up stream of the absolute filter which is in the building ventilation exhaust duct. He also intends installing a GM tube down stream of this final absolute filter, just before the exhaust goes up the stack. It was observed that a wind direction indicator and anemometer were installed on the top of the containment shell. Mr. Charles Dady, the Health Physicist, said that the read-out from these instruments has not as yet been hooked up but that it would go to the Health Physics Office.

Health Physics

Mr. Charles Dady is the Health Physicist at the reactor. The Watertown Arsenal has a Health Physicist for the rest of the Arsenal Operations.

Mr. Dady is a graduate chemist. He was employed three years in an analytical chemistry laboratory and was at Vanderbilt University one year as an AEC Radiological Fellow. During this time, he spent three months at Oak Ridge in the Health Physics Department. In addition, he attended for one year most of the courses in the Oak Ridge School of Reactor Technology, and he was assigned to the Operations group for four-weeks at the ORR. Mr. Dady said that a Dr. Weeks is presently giving weekly lectures to the three men who will be the reactor operators of the OMRO. These men have been attending these lectures now for the past three months. Dady stated that the reactor will have film badge service from the Lexington Signal Depot of the U. S. Army Signal Corp. Beta-gamma and neutron film badges will be used. The beta-gamma badges will be changed every four weeks and the neutron badges every two weeks. Arrangements have been made that any reading over 300 mr total will be reported immediately back to OMRO and also to the Surgeon-General. Dady stated that anyone who would be working at the reactor for one month or more would be furnished with a film badge. In addition, they are getting 65 self-reading dosimeters.

On the basis of the original shield survey, when the reactor first goes to power, film badges will be placed around the building. Dady said that the only entrance into the containment shell for personnel will be past the Health Physics Office and past a receptionist at the #1 airlock, so that there should be good control over personnel entrance to the building. He is presently getting the data on the gaseous and particulate monitoring inside the containment building. He stated that he intends finding out exactly what is the delay time of all the radiation monitoring. The following Health Physics equipment was noted to be on hand:

Portable Equipment

8 GM survey meters - Nuclear-Chicago
3 Fast neutron Hurst detectors - Nuclear Corporation of America
1 Fast and slow neutron detector - Nuclear-Chicago
1 Thermo-neutron detector Ekco
1 BF-3 counting system scaler, linear amplifier, and detector
3 Juno survey meters, 0 to 5 r/hr
2 Jordan meters, 0 - 10,000 r/hr
(These last two meters are equipped with 6' extensions.)

Other equipment includes a single channel gamma ray spectrometer, a Picker type well counter, a scaler, and an end-window GM counter and two NMC proportional counters. Dady stated that he has a one millicurie Co-60 source for calibration purposes and that he has made arrangements for borrowing a 46 millicurie Co-60 source from MIT for calibrations. The Arsenal has two 5 curie Pu-Be neutron sources. Dady stated that these have been leak tested.

The following protective equipment was observed to be on hand: gloves, shoe covers, overshoes, two Kemos gas masks, 1 mask with an oxygen cylinder, 5 particulate filter masks, 2 complete plastic suits with head pieces. Mr. Dady stated that all operators of the reactor of the reactor will be equipped with coveralls and yellow radiation area safety shoes.

Dady stated that Local Civil Defense representative and also the Fire Chief and the Chief of Police of Watertown have visited the site and have been given a complete tour of the reactor facility. He also stated that there is a local radiological safety emergency team under the Chemical Warfare Officer of the Watertown Arsenal Reactor. All of the organizations have been instructed to contact the reactor health physicist immediately in any emergency situation. Arrangements have been made for the disposal of solid waste material through Marine Disposal of Boston. Liquid waste will be stored in any of three hold-up tanks before discharge to the Metropolitan Severage System and will be sampled for gross beta-gamma and alpha before discharge.

Reactor Start-Up

The OMRO had engaged the Vara Corporation as their general contractor. The Vara Corporation then sub-contracted the reactor part of the contract to the Curtiss-Wright Corporation. The basic design of the reactor had been a joint venture of the Bendix Corporation and the OMRO people at Watertown. Curtiss-Wright then manufactured the control rod drives which had been designed by Bendix. The instrumentation was designed by Bendix and OMRO and was furnished for the most part by Leeds and Northrop.

As part of the reactor contract, it is the responsibility of the Curtiss-Wright Corporation to start-up the reactor, and to perform a series of low power tests to obtain the various co-efficients of the reactor. It will also evaluate the worth of various experimental arrangements and of the beam tubes in either flooded or non-flooded condition. The Curtiss-Wright start-up team consisted of Peer G. Neilsen, Project Manager, Mr. William Hall, Start-up Supervisor, and Howard Aderholt, Instrument Technician.

Mr. Neilsen is the project manager for Curtiss-Wright of the Watertown Arsenal reactor. He has worked for Curtiss-Wright from 1958 to the present time, specializing in heat transfer and thermo dynamic and fluid dynamic analysis and design of nuclear systems. From 1956 thru 1958, he worked for the Martin Company in its nuclear power division as a system analysis engineer and for ACF Industries, Inc., the ERCO Nuclear Products Division, as a process engineer. Mr. Neilsen is licensed to operate the Curtiss-Wright pool reactor at Quehanna, Pennsylvania.

Mr. William Hall had been the Operations Supervisor at the Curtiss-Wright reactor at Quehanna, Pennsylvania from last fall to the present time.

Mr. Aderholt had been an instrument technician on the Curtiss-Wright reactor.

Both Mr. Hall and Mr. Aderholt are licensed to operate the Curtiss-Wright Quehanna reactor. The Curtiss-Wright Division at Quehanna is now defunct and the Curtiss-Wright team at the Watertown Arsenal reactor reports to an electronics division of Curtiss-Wright at Princeton, New Jersey.

The licensee for this reactor will be the Ordnance Materials Research Office at the Watertown Arsenal, Watertown, Massachusetts, and the person responsible for the actual operation of the reactor will be Mr. John O' Connor. Mr. O'Connor's background includes a Master of Science Degree in Physics at Boston College and Graduation from the Oak Ridge School of Reactor Technology in 1953. Since 1953, he has worked at various National Laboratories as a guest scientist in the field of reactor physics. He has also been a guest physicist at the Massachusetts Institute of Technology.

Mr. Richard Stanton, who will be the reactor engineer for OMRO, holds a degree in Engineering from Stevens in 1952; he was chief electrician's mate in the U. S. Navy, and holds a 1st Engineer's Operating License in the Merchant Marine. He has held engineering positions with Combustion Engineering and with Stone and Webster. He has also earned the degree of Master of Physics from Boston College. He had been associated with the OMRO reactor since July, 1959.

The Curtiss-Wright team had completed a series of start-up tests, which they reported in start-up test report #1. Tests have been made to check sticking or delay due to friction of regulating and control rod movements. These rods have been withdrawn and inserted into the reactor, both with and without coolant flow, a minimum of 100 consecutive times without failure or any indication of mal-functioning. In addition, drop time of the three safety rods had been determined. The drop time in all cases was stated to be less than .6 seconds. In addition, the fission chamber was withdrawn and inserted into the reactor a minimum of 10 times to demonstrate proper operation both with and without full coolant flow of 930 gallons/minute. The level safety amplifiers and the log-in channel were both checked by artificial signals.

When the inspector first arrived, the reactor was loaded with dummy fuel elements. The Curtiss-Wright team demonstrated the daily check-out procedure of the instrumentation and also demonstrated the actual operation of the control rods and a scramming of these rods. In preparation for the nuclear start-up, the team then discharged the dummy fuel elements from the reactor. This was done by a man donning skin diving equipment and manually removing the dummy fuel elements from the grid plate. Mr. O' Connor said that skin diving had been used by the Curtiss-Wright team for the last month of check-out and test of the rod drives. O'Connor also said that it was the intention of the Curtiss-Wright team to load the reactor with the fuel elements by the same technique. The inspector then stated that if such a method were to be employed, permission must first be obtained from the Hazards Evaluation Branch of the Division of Licensing and Regulation. A telephone call was then placed to Mr. Ed Case and also to Clifford Beck of the Hazards Evaluation Branch. Mr. Neilsen spoke at some length with Clifford Beck and reported that Beck agreed that the four partial fuel elements which are in the control rod positions could be loaded into the reactor by skin diving equipment. This decision was reached at the end of the first working day of the inspection, and it was reported that Mr. Beck would give a decision on whether or not to allow skin diving for the rest of the loading and the low power tests on the following day. Mr. O'Connor, Dr. Cochran, and the inspector were of the opinion that the skin diving technique was not the best method to employ to load this reactor and continued the discussion with the Curtiss-Wright team for some time. By the morning of the second day, it was agreed that no skin diving would be used during the initial start-up. A call was then placed by the inspector to the Division of Licensing and Regulation to recommend the issuance of an operating license for this facility. The issuance of the license was confirmed over the telephone with the understanding that there would be no skin diving without prior written permission of the Commission.

Since the operating license incorporates the possession and use of the special nuclear material, the fuel elements could not be unloaded at the facility before the license was issued. When the first attempt was made to load a fuel element into the reactor by means of the conventional long handling tool, it was discovered that the fuel element did bind in the hole in the grid plate. A decision was made to lower the water in the pool so that the clearance of the fuel element nose piece in the grid plate could be examined at close hand. The gate was installed in the annular well around the pool and the pool itself was drained down to the top of the fuel elements. A member of the Curtiss-Wright team then examined the clearance of the fuel element in the grid plate by being lowered into the pool area on a Bosun's chair slung from the overhead crane. It was then decided that all fuel elements should have the nose pieces turned down by approximately .010" on the diameter. The Curtiss-Wright team asked for permission to load the four partial control rod elements and the first eight elements manually while the pool level was down. The reason for this was because of the difficulty in installing these elements by the long handling tool from the reactor top. Mr. O'Connor, Dr. Cochran, and the inspector agreed that this would be a safe procedure to load this first loading by a man being lowered on the Bosun's chair. The pool was then refilled with demineralized water and the rest of the loading to criticality was made in the conventional manner by loading one fuel element at a time by means of a long handling tool. Count rates were taken between element loadings and the inverse multiplication plotted against the number of fuel elements.

A number of faults in good operating procedure by the Curtiss-Wright team were noted during the approach to criticality:

1. The plot of inverse multiplication versus the number of the fuel elements predicted that the critical mass would be approximately 29 fuel elements. After the addition of the 24th fuel element, a scaler attached to a BF-3 counter in the horizontal beam tube commenced to malfunction. The Curtiss-Wright team did not deem this particular malfunction to be worthy of repair in spite of the fact that this channel had been giving very good and reliable information during the approach.

2. It was not until they were reminded by the inspector that the Curtiss-Wright team agreed to take more than one count after each element was added.

3. Counts were taken with the rods fully withdrawn and also with the rods halfway in. However, at no time was a count taken with the rods fully in, so that a preliminary evaluation could be gotten of the worth of the rods before criticality was actually reached.

4. As the 29th fuel element was added to the reactor, it became evident from the examination of the approach curves that a re-arrangement

of some of the fuel elements and the source might bring about a critical configuration. The decision was made to move the source. In order to do this, the Curtiss-Wright team did not think it necessary to remove more than 1 fuel element when the source was moved. It was only after a length discussion by Mr. O'Connor and the inspector that the Curtiss-Wright team agreed to remove a total of 4 fuel elements in order to get some new points on a new approach graph.

The argument of the Curtiss-Wright team was that the auxiliary channels of information were simply indications during the approach and that the final proof of criticality would be gotten from the single log count rate recorder on the control board.

The reactor finally went critical with the new configuration.

In view of the evident lack of knowledge on the part of the Curtiss-Wright team on good reactor operating procedure, the inspector recommended to Col. Dunn, the Executive Officer of the Watertown Arsenal after the reactor, after the inspection, that no reactor operation should be permitted unless Mr. O'Connor is in attendance and that if, at any time, there is a difference of opinion, Mr. O'Connor must have the final word.

The inspector also made a number of suggestions to Mr. O'Connor.

1. OMRO should examine very closely the drawings of the control rod drive for any unusual parts which may be incorporated therein. Since this drive is of Curtiss-Wright manufacture and Bendix design, spare parts may be hard to come by in the future, and any replacement parts should be ordered now.

2. The Nuclear instrumentation, with the exception of the temporary scaler, seemed to operate reasonably well during the initial start-up. However, it was observed that there was room for much improvement in the layout of wiring in the back of the control board as far as shielding of cables from ion chambers is concerned.

3. It was finally recommended to Mr. O'Connor that he insist upon having an up-to-date wiring diagram of any and all of the latest changes before the Curtiss-Wright team is allowed to declare their contract fulfilled.

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

✓ Docket Nos. 40-2253 ✓
70-263 ✓

JAN 18 1979

Department of the Army
Army Materials and Mechanics
Research Center
ATTN: Dr. E. S. Wright
Director
Watertown, Massachusetts 02172

Gentlemen:

Subject: Inspection 78-02

This refers to your letter dated December 20, 1978, in response to our letter dated November 24, 1978.

Thank you for informing us of the corrective and preventive actions documented in your letter. These actions will be examined during a subsequent inspection of your licensed program.

Your cooperation with us is appreciated.

Sincerely,

for Robert O. McClintock, Chief
Materials Radiological Protection
Section

bcc:
IE Mail & Files (For Appropriate Distribution)
Central Files
Public Document Room (PDR)
Nuclear Safety Information Center (NSIC)
REG:I Reading Room
Commonwealth of Massachusetts (2)

7903060018
PDR/LPDR

DEPARTMENT OF THE ARMY
ARMY MATERIALS AND MECHANICS RESEARCH CENTER
WATERTOWN, MASSACHUSETTS 02172

DRXMR-AR

DEC [illegible]

SUBJECT: NRC Inspection 78-02

Mr. Robert O. McClintock, Chief,
Materials Radiological Protection Section
U.S. Nuclear Regulatory Commission
Region I
63 Park Avenue
King of Prussia, PA 19406

Dear Mr. McClintock:

The following information is furnished in response to your letter dated 24 November 1978, Docket Nos. 40-2253 and 70-263:

1. Operations involving depleted uranium which require exhaust stack air sampling to ensure compliance with 10 CFR 20.106 are:

a. Uranium Incinerator, Bldg. 43

b. Uranium Melt Facility, Bldg. 43

c. Uranium Machine Shop, Bldg. 312

2. The following action has been or will be taken to correct the infraction:

a. Corrective steps which have been taken and the results achieved:

(1) All monitoring of the uranium incineration process was in compliance with 10 CFR 20.106 at the time of inspection. Isokinetic stack air samples are taken at least monthly during those months when uranium machine turnings are incinerated.

(2) Isokinetic stack air sampling of the uranium machine shop effluent will be increased to at least monthly.

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PDR

DRXMR-AR
SUBJECT: NRC Inspection 78-02

(3) Isokinetic stack air sampling is conducted in accordance with the procedures specified in Supplement I (Item 9), para 3.c(3)(c) and 3.c(3)(d) of the Army Materials and Mechanics Research Center Application for Renewal of Source Material License SUB-238, dated 11 May 1973.

b. Corrective steps which will be taken to avoid further items of non-compliance:

(1) Action is currently being taken to modify the exhaust stack to the uranium melt facility to facilitate isokinetic stack air sampling. As our uranium melt program is sporadic, stack air sampling will be conducted at least monthly during crucible cleaning operations where uranium particulate release is greatest.

(2) Additional isokinetic sampling probes are in process of fabrication to facilitate air sampling.

(3) The feasibility of using continuous stack air monitors will also be investigated.

c. Date when full compliance will be achieved. Full compliance with 10 CFR 20.106 will be achieved by 28 February 1979.

Sincerely,

E S Wright
E. S. WRIGHT
Director

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

Docket Nos. 40-2253
70-263

NOV 24 1978

Department of the Army
Army Materials and Mechanics
Research Center
ATTN: Dr. E. S. Wright
Director
Watertown, Massachusetts 02172

Gentlemen:

Subject: Inspection 78-02

This refers to the inspection conducted by Mr. P. Jerman of this office on November 9, 1978, of activities authorized by NRC License Nos. SUB-238 and SNM-244 and to the discussions of our findings held by Mr. Jerman with yourself and other members of your staff at the conclusion of the inspection.

The inspection was an examination of activities conducted under your licenses as they relate to radiation safety and to compliance with the Commission's rules and regulations and the conditions of your licenses. The inspection consisted of selective examinations of procedures and representative records, interviews with personnel, measurements made by the inspector, and observations by the inspector.

In addition, our inspector took wipe samples of floors in your uranium facility. These samples were analyzed in our Regional Office Laboratory. The basic purpose of these independent measurements was to verify your capability for identifying and evaluating radioactive contaminants in your facility. The results of our analysis indicate compliance with your license conditions and were in agreement with your analysis.

Based on the results of this inspection, it appears that one of your activities was not conducted in full compliance with NRC requirements, as set forth in the Notice of Violation, enclosed herewith as Appendix A. This item of noncompliance has been categorized into the levels as described in our correspondence to you dated December 31, 1974. This notice is sent to you pursuant to the provisions of Section 2.201 of the

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PDR

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NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations. Section 2.201 requires you to submit to this office, within twenty (20) days of your receipt of this notice, a written statement or explanation in reply including: (1) corrective steps which have been taken by you and the results achieved; (2) corrective steps which will be taken to avoid further items of noncompliance; and (3) the date when full compliance will be achieved.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and your reply will be placed in the Public Document Room.

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

J S Davis
for Robert O. McClintock, Chief
Materials Radiological Protection
Section

Enclosure: Appendix A, Notice of Violation

bcc w/encl:
IE Mail & Files (For Appropriate Distribution)
Central Files
Public Document Room (PDR)
Nuclear Safety Information Center (NSIC)
REG:I Reading Room
Commonwealth of Massachusetts (2)

APPENDIX A

NOTICE OF VIOLATION

Department of the Army
Army Materials and Mechanics Research Center
Watertown, Massachusetts 02172
License No. SUB-238

Docket No. 40-2253

Based on the results of an NRC inspection conducted on November 9, 1978, it appears that one of your activities was not conducted in full compliance with NRC regulations as indicated below:

10 CFR 20.201(b) requires you to make such surveys as may be necessary for you to comply with all sections of Part 20.

Contrary to this requirement, as of November 9, 1978, you failed to make such surveys as were necessary to assure compliance with 10 CFR 20.106, "Concentrations in effluents to unrestricted areas," a regulation that limits the average yearly concentration of uranium-238 in air discharged to unrestricted areas. We note that you did make surveys which were intended to meet this requirement, but the frequency of these surveys was insufficient to assure compliance during all operations.

This is an infraction.

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