U. S. ATOMIC ENERGY COMMISSION
REGION I
DIVISION OF COMPLIANCE

August 18, 1966

CO REPORT NO. 47/66-2

Title: U. S. ARMY MATERIALS RESEARCH AGENCY - WATERTOWN ARSENAL
LICENSE NO. R-65
Date of Visit: August 3, 1966

By : J. P. O'Reilly for
John R. Sears, Reactor Inspector

SUMMARY

A routine announced visit was made to the Watertown Arsenal reactor. The reactor is being operated ten hours a day a: 2 Mw.

A satisfactory containment leak rate test was made in March 1966.

The Safety Committee still reviews all experiments and irradiations.

No items of noncompliance or safety problems were observed during the visit.

DETAILS

I. Scope of Visit

A visit was made to the Watertown Arsenal reactor of the U. S. Army Materials Research Agency at Watertown, Massachusetts, by Mr. John R. Sears, Reactor Inspector, Region I, Division of Compliance, on August 3, 1966. The visit included a tour of the facility, examination

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Scope of Visit (continued)

of operating and health physics records, attendance at a meeting of the Reactor Safeguards Committee, and discussions with the following personnel:

Mr. John O'Connor, Reactor Director
Mr. Richard Stanton, Reactor Engineer
Mr. Richard Dady, Health Physicist
Mr. Joseph Vella, Maintenance Foreman
Mr. Paul O'Connor, Shift Supervisor
Dr. Homer Priest, Chairman, Reactor Safeguards Committee
Dr. John Antal, Reactor Safeguards Committee
(and others on the Committee staff)

II. Results of Visit

A. Containment Test

Records were reviewed which show that a containment leak rate test was made in March 1966. The leak rate, at 2 psig, was 2.85% per day with the outer airlock doors closed and the inner doors open, and 2.44% with the outer doors open and the inner doors closed.

B. Personnel

The reactor is now operated at 2 Mw on a ten hour day, 0730 to 1730, and shutdown on weekends.

Mr. John Bailey, formerly a Shift Supervisor, quit for a mechanical engineering job with the Corps of Engineers. Mr. O'Connor is recruiting for a replacement in order to increase operating time to two shifts.

Mr. Charles Dady, Health Physicist, and Mr. Richard Stanton, Reactor Engineer, both confided to the inspector that they are considering other employment owing to the uncertain future they feel they have at the Arsenal.

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Results of Visit (continued)

Mr. Dady stated that the Arsenal health physicist has managed to survive the Army cut-back by getting himself declared a Chief. The paper organization then has a GS-9 position under this Chief who shall perform health physics duties at the reactor. There is presently no one in that position, and Mr. Dady stated that there is no active recruitment for an applicant. Mr. Dady is a GS-13 and is rated as a radiochemist. He divides his time between assisting experimenters, employing radiochemical techniques, and supervising two health physics technicians who do the routine health physics surveillance work.

Mr. O'Connor showed the inspector copies of tests from a continuing reactor operator training program. These are written tests which are given weekly. They are designed to be answerable by a competent operator in about two hours.

C. Health Physics

Records of shield surveys, smears, personnel monitoring, gaseous and particulate stack releases, and liquid discharges during the past six months were reviewed by the inspector. No violations of 10 CFR 20 were observed in this review.

During 2 Mw operation, stack gaseous activity averages about 5 - 6 x 10^{-6} uc/cc, principally A-41. The dilution factor for this facility is 10^{-10} seconds per cubic centimeter.

200,850 gallons of liquid waste, with a total activity of 1683 uc, were discharged to the sanitary sewer system during 1966. Mr. O'Connor stated that he expects that this volume will decrease in the future since they installed a new bed in their demineralizer during the last Spring.

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Results of Visit (continued)

The Army Materials Command Headquarters Safety Division had requested Mr. O'Connor to furnish them with a written environmental radiological monitoring procedure. Mr. O'Connor showed the inspector a copy of his reply which describes the present point-of-discharge surveillance program. Mr. O'Connor also stated that in view of their history during normal operation, he does not intend increasing the program unless he is so directed.

Mr. O'Connor also showed the inspector a letter from the Massachusetts Department of Public Health which states that they and the U. S. Public Health Service maintain approximately 80 monitoring stations in the greater Boston area. All include 2" filter paper air samplers which did show evidence of fallout from the Chinese bomb test. Thirty stations have film badges, processed by Technical Operations, Inc., which showed no response to the Chinese fallout. Massachusetts Institute of Technology has 11 stations which showed no accumulation from reactor operations over an 11 month period. The nearest monitoring station to the Arsenal reactor is 1½ miles away. The letter concludes by recommending that the Arsenal do no monitoring beyond the Arsenal boundaries.

Mr. Dady informed the inspector that hardware has been purchased for a liquid level indicator which will see the level in the concrete storage tank. It will read out in the health physics office.

Mr. O'Connor stated that their absolute filters in the exhaust air duct have never been tested in place. However, he pointed out that the isolation valve is between the filter and the stack, and this valve is tested regularly. He further stated that pressure drop across the filter has not increased since the original installation.

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Results of Visit (continued)

D. Audit

Mr. O'Connor stated that their arrangement with their consultant, Dr. Robert Cochran, is that he would visit the facility whenever asked by Mr. O'Connor. This has averaged out to at least one visit per year. It is planned that he will make a visit before the end of the year when 5 Mw operation is scheduled to begin.

The reactor facility was inspected by a team from the Army Inspector General's Office in the Spring. Mr. O'Connor said that they had no adverse criticism regarding reactor or radiation safety but that they gave him an unsatisfactory mark on industrial safety. The reason was because of a temporary platform over the out-of-pile mock-up of a methane cooled experiment.

E. Preventive Maintenance

The preventive maintenance program of periodic checks and inspections is still in force.

The stainless steel control rods have been visually inspected every 50 Mwd. This has been about every six months to date; it will occur about every three months at 2 Mw operation. The inspection is made under one foot of water. No deterioration of the rods has been observed.

The stainless steel tube bundle in the heat exchanger has shown no evidence of leaks.

F. Drills

Two drills were held during the Spring; one for a simulated radiation emergency and the other a fire drill.

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Results of Visit (continued)

Mr. O'Connor stated that one of the principal benefits of the drills is that they demonstrate the extent of cannibalizing of equipment in the emergency locker.

G. Exit Interview

The inspector attended a meeting of the Reactor Safeguards Committee, which was also his exit interview.

Mr. O'Connor made his annual operations report. He explained that a few unplanned scrams were due to operator error in which an operator had moved the log N period chamber too quickly. Dr. Priest suggested the installation of a fine pitch Saginaw drive. There was a difference of opinion on whether this should be manual or electrically operated.

The inspector made a strong case that the health physics staffing situation needed straightening out. The Committee agreed unanimously and stated that they intended quoting the inspector in their report to the Army.

The inspector brought up the fact that the exhaust air absolute filters have never been tested in place. Mr. O'Connor and Dr. Priest defended the manufacturer's stated efficiency of the filter media but agreed that there could be bypassing around the filter of which they were not aware. Dr. Priest stated that an in-place test would be given serious consideration.