AUG 0 8 1984

Docket No. 50-219

GPU Nuclear Corporation
ATTN: Mr. P. B. Fiedler
Vice President and Director
Oyster Creek Nuclear Generating Station
P. O. Box 388
Forked River, New Jersey 08731

Gentlemen:

Subject: Radwaste Overboard Discharge Piping Maintenance

This refers to your letter dated June 6, 1984 in response to our letter dated May 10, 1984 forwarding questions to be answered after our preliminary review of an allegation on this subject. This preliminary review was performed on May 2, 1984 following receipt of the allegation on May 1, 1984.

We have reviewed and evaluated the information you provided relative to the performance of maintenance on the radwaste overboard discharge piping. In addition, the circumstances associated with the incident have been reviewed during site inspections since the May 1, 1984 allegation. The inspection activity and the resultant findings are described in Report No. 50-219/84-11.

We concur with your description of the incident and the corrective action taken. We also concur the incident in question was an isolated occurrence which is not indicative of a programmatic problem caused by inadequate procedures. Also, the numerous surveys which were performed, both before and after cutting of the line, indicate the potential for worker exposure to contamination was minimal.

The performance of maintenance on the radwaste overboard discharge piping was a violation of Technical Specification 6.8 in that Station Procedure 915.12, "Radiation Work Permit" was not implemented. However, since it is the desire of the NRC to encourage and support licensee initiative for self-identification and correction of problems, and in accordance with 10 CFR Part 2, Appendix C, no enforcement action will be taken since the violation was (1) identified by you, (2) was a Severity Level IV violation, (3) was promptly corrected, and (4) was not a violation that could reasonably be expected to have been prevented by corrective action for a previous violation.

Your cooperation with us is appreciated.

Sincerely,

Original Signed By:

Richard W. Starostecki, Director
Division of Project and Resident
Programs

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07/24/84

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cc:
BWR Licensing Manager
Licensing Manager, Oyster Creek
Public Document Room (PDR)
Local Public Document Room (LPDR)
Nuclear Safety Information Center (NSIC)
NRC Resident Inspector
State of New Jersey

bcc:
Region I Docket Room (with concurrences)
DPRP Section Chief

RI:DPRP	RI:DPRP	RI:DETP	RI:DPRP
Baunack/meo	Conner	Bellamy	Starostecki
7/24/84	7/31/84	7/27/84	8/8/84

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07/24/84

GPU Nuclear

GPU Nuclear Corporation
Post Office Box 388
Route 9 South
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609 971-4000
Writer's Direct Dial Number:

June 6, 1984

Mr. Richard W. Starostecki, Director
Division of Project and Resident
Programs
U.S. Nuclear Regulatory Commission
Region I
631 Park Avenue
King of Prussia, PA 19406

Dear Mr. Starostecki:

Subject: Oyster Creek Nuclear Generating Station
Docket No. 50-219
Radwaste Overboard Discharge Piping Maintenance

The attachments to this letter provide our evaluation with supporting documentation of the incident referred to in your letter dated May 10, 1984. As discussed therein, we conclude that there are no programmatic deficiences existent amongst the departments involved and that appropriate corrective actions were taken expeditiously.

If you should have any questions, please contact me or Mr. Drew Holland at (609)971-4643.

Very truly yours,

Peter B. Fiedler
Vice President and Director
Oyster Creek

PBF:PFC:dam
Attachments

cc: Dr. Thomas E. Murley, Administrator
Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

NRC Resident Inspector
Oyster Creek Nuclear Generating Station
Forked River, NJ 08731

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BACKGROUND

The possibility of a leak in the overboard discharge piping was first noted by radwaste operations personnel on Wednesday, March 14, 1984. A cave-in had been found under the sidewalk near the southwest corner of the Old Radwaste Building. At first, it was thought that the cave-in was due to the extremely heavy rains which had occurred on Tuesday, March 13, and the early morning hours of Wednesday, March 14. Further observations confirmed that water was in fact bubbling up from underground. Since the 30 inch diameter service water discharge header and radwaste overboard discharge line to the service water header run underground in the area of the cave-in, it was thought that this piping or connection could be the source of the leakage. As an overboard discharge was then in progress the discharge was promptly stopped. A water sample was then obtained by Chemistry personnel. The analysis of the water sample indicated activity levels less than minimum detectable activity (MDA) of 1×10^{-7}uCi/cc. Excavation in this area revealed no leakage.

On Thursday, March 15, further excavation was performed to uncover more of the radwaste overboard discharge line outside the Old Radwaste Building. No leaks were found in the portion of pipe which was exposed. A sample of the water in the excavation was obtained. Analysis disclosed a small amount of Cesium 137 activity, below the administrative limit of 20 percent of 10 CFR 20. In an attempt to verify the source of the leakage, demineralized water was flushed through the overboard discharge line. As soon as the flush started, water was observed leaking into the excavation. The source of the leakage was determined to be beneath the Old Radwaste Building, in the vicinity of the point where the pipe penetrates the floor of the building. The overboard discharge isolation valves were tagged out to prevent any further discharges until repairs were completed.

Excavation resumed on Friday, March 16. The intent was to expose the pipe all the way back to the pipe penetration in the floor of the building. In order to do this, it was necessary to excavate beneath the foundation of the building. During the course of the digging, seven (7) soil samples were obtained at various locations. The sample analysis showed some activity, but all were below applicable station limits. Also, dirt was directly surveyed during excavation with a HP210 probe and no contamination was detected. By the evening of Friday, March 16, excavation was complete and the pipe uncovered to the leakage source. A hole was found adjacent to a 90 degree elbow. The hole was large enough that a person could reach inside. In an effort to characterize the radiological status of the pipe internals, a Radiological Controls technician wearing gloves took several smearable contamination wipes on the internal surfaces of the pipe. The results indicated smearable contamination to be less than 1000 dpm/100 cm^2. In addition, a large area gross wipe was taken inside the pipe. The gross wipe indicated 800 cpm above background.

Dose rates taken on the external surface of the pipe were less than 2 mR/hr., with no detectable Beta present. However, the hole in the pipe was not large enough to place a dose rate meter inside the pipe. Up to this point in time, all work had been performed without a Radiation Work Permit (RWP), with the full knowledge of the Radiological Controls Department (Rad Con). None of the criteria which require the use of an approved RWP had yet been met. The work was within the Radiologically Controlled Area of the plant, and all workers were wearing proper dosimetry.

At this point late Friday afternoon, March 16, discussions began concerning the methods to be used to repair the damaged pipe. The damaged section would obviously have to be replaced, but the details of how this was to be accomplished (i.e., location of cuts, method of cutting, type of replacement material, etc.) was turned over to the Plant Engineering Department for resolution. In anticipation of making the cuts upon receiving Engineering direction, the Maintenance and Construction Department (M&C) Area Supervisor submitted a Radiological Engineering Review Request to the Radiological Engineering group, for the purpose of receiving detailed radiological requirements which would be imposed for the work. No RWP was submitted at that time. Rad Con personnel (both Field Operations and Rad Engineering) assumed that an RWP would be submitted before repair work commenced. It was obvious to them that an RWP was required because of the likelihood of fixed contamination inside the pipe. It was further assumed that, since no RWP was submitted Friday night, there were no plans to work the job on the weekend.

During the day on Saturday, March 17, Maintenance and Construction workers erected a temporary structure over the excavation to shelter the work area from rain. Also on Saturday, the M&C Area Supervisor said that he believed that the pipe was clean. This led him to believe that an RWP would not be required. He overlooked the possibility of fixed contamination on the pipe internals.

On Sunday, March 18, the M&C Area Supervisor, having received direction from Plant Engineering, turned the job of cutting the pipe over to a Job Supervisor and work crew telling them that an RWP was not necessary. The work crew spent most of the day gathering equipment for the job and did not notify Rad Con personnel of their intent to begin work because they believed this to be a non-RWP job. Upon arriving at the job site, the work crew did not encounter any special radiological postings around the excavated area, further reinforcing their belief that an RWP was not required. In order to facilitate any further preparatory work needed prior to making the cut, the Rad Con Department had withheld erection of any special postings. Conditions did not yet exist requiring such postings because the job site was already within a posted Radiation Area and Radiologically Controlled Area (RCA). No smearable contamination above limits had been detected, and the pipe itself, being a permanently installed process system, was not labelled.

Late Sunday afternoon, the work crew cut out the damaged section of pipe using a torch and grinding wheels. Since an RWP/RER had not been obtained, no radiological precautions were taken. However, standard hot work and burning precautions were used (i.e., welder's masks and gloves, coveralls) by the

personnel actually performing the work. After cutting out the damaged section of pipe, the work crew removed it from the excavation and carried it to the RCA exit, intending to take it to the machine shop for measurements. Upon frisking themselves and the piece of pipe, it was discovered that the pipe was contaminated. Also, one worker's gloves and one shoe were contaminated, and another worker's gloves were contaminated. The workers immediately notified the on-duty Group Radiological Controls Supervisor (GRCS) of the situation. The GRCS had been unaware that this work had been taking place. Surveys were started on the path of travel from the job site to the frisking area, and of the job site itself. The pipe section was surveyed and bagged. The GRCS notified the Rad Con Field Operations Manager, who directed that a hold be placed on any further work, and that Whole Body Counts (WBC) be arranged for all workers who were involved in the incident. The WBCs were performed Sunday night, March 18. Surveys of the removed pipe section and the exposed pipe ends at the job site showed no smearable contamination on the externals, some low level smearable contamination and higher levels of fixed contamination on the pipe internals. Since an earlier (prior to cutting) survey of the pipe internals had not shown any smearable contamination, it was thought that the flame cutting and grinding operations had loosened some of the fixed contamination. The exposed pipe ends at the job site were bagged and labelled.

On Monday morning, March 19, the M&C Area Supervisor was made aware of what had happened, and he submitted an RWP in order to continue with the repair work. The Rad Engineering Review which he had requested earlier was completed on Monday. On Tuesday, March 20, the RWP/RER for the work was issued, the normal radiological controls for this type of work were established, and work proceeded from that point on without further incident.

On Tuesday, March 27, a formal critique was held with the entire work crew, the M&C Job Supervisor and Area Supervisor, and M&C and Rad Con Management. This critique completed the Company's investigation of the incident, and was performed within the required time limits.

SPECIFICS

1. How, when and by whom this event was identified and to whom it was reported.

   This event (cutting pipe without an approved Radiation Work Permit) was first identified by the Maintenance and Construction work crew when they attempted to remove the severed section of pipe from the Radiologically Controlled area of the plant at about 1745 hrs on Sunday, March 18. When they checked the section of pipe with a frisker, the frisker alarmed. Realizing the significance of this, they immediately notified the on-duty Group Radiological Controls Supervisor by telephone. After determining what had occurred, the GRCS in turn notified the Rad Con Field Operations Manager at home by telephone.

2. The date(s) on which the event occurred.

The actual cutting of the pipe occurred late in the afternoon on Sunday, March 18. Upon discovery of what had occurred, a hold was placed on any further work. On March 20, an approved RWP/RER was issued for the repair work. No work was performed between Sunday evening and the issuance of the RWP on Tuesday. After the RWP/RER was issued on Tuesday, March 20, work proceeded without further incident.

3. The potential for worker exposure to, contamination from and/or internal deposition of radioactive material.

The initial smear survey (#3873-84) taken inside the pipe on Friday, March 16, indicated that there was no smearable contamination present above limits, although a gross wipe taken over a large area did indicate a small amount of smearable activity. There was a high probability of fixed contamination on the internals of the pipe. The hole in the pipe was not large enough to allow direct measurements to be taken on the pipe internals. The outside of the pipe was clean, soil and water samples taken in the excavation were all below applicable limits, and dose rates in the work area and on contact with the pipe were less than 2 mRem/hr. Also, it was noted by several individuals who inspected the damaged section of pipe that there was an inward flow of air through the hole in the pipe. This was thought to be due to a vortex aspiration effect from the large volume of gravity flow through the Service Water Discharge Header. The Radwaste Overboard Discharge Line ties into the top of the Service Water Discharge Header. The flow through the Service Water line was creating a vacuum in the Overboard Discharge Line. This theory was borne out by the fact that even after the torch cutting and grinding operations, no smearable contamination was detected on the externals of the pipe, only on the internals. The highest levels of smearable contamination found after cutting on the internals of either the removed section of pipe or the piping which remained in place were 12,000 dpm/100 cm^2 (Survey Nos. 3955-84 and 3959-84). The results of an air sample taken in the work area containment immediately after the incident was discovered were 8.0 E-11 uCi/cc gross beta-gamma. The workers who actually performed the cutting, while not wearing Anti-Contamination clothing or respiratory protection, were wearing welding masks, gloves and work coveralls. This gear was all frisked and found to be free of contamination. The two workers who received clothing contamination (work gloves) were thought to have done so during the transfer of the pipe section from the job site to the frisking station at the RCA exit point. Whole body counts performed on all of the workers involved showed no activity above MDA.

In retrospect, although no conscious decision was made beforehand to allow the job to begin without engineering controls and protective clothing, it is felt that, because of conditions which existed at the time of the cutting and results of surveys and Whole Body Counts performed after the fact, the potential for worker exposure to contamination and/or internal deposition was minimal.

4. The results of any surveys performed before, during or after the work was performed.

During preliminary excavation work to find the source of leakage and after the hole in the pipe had been uncovered, several water and soil samples were obtained and analyzed by the Chemistry Department. The results of these samples are summarized in the attached memorandum to C. J. Halbfoster, Manager - Plant Chemistry, dated April 12, 1984. The activity in all samples was below applicable station limits. Dirt being removed from the excavation was randomly surveyed by direct frisk with an HP210 probe. No activity greater than 100 cpm above background was detected. After the hole in the pipe was made accessible, several smears were taken on the pipe internals. All these smears showed loose contamination to be less than 1000 dpm/100 cm^2.

Since the Rad Con Department was not aware that the pipe was being cut on the afternoon of March 18, there was no Rad Con technician in attendance, and, therefore, no surveys were taken during the actual cutting evolution. Follow-up surveys that were taken on the evening of March 18, after cutting, indicated that some relatively low-level smearable contamination (12,000 dpm/100 cm^2 highest) was generated during the cutting process; however, the smearable contamination was confined to the internals of the pipe, probably by the inward flow of air into the pipe. These same surveys showed that there was no spread of contamination either at the job site or along the path of travel from the job site to the friskers at the RCA exit. The removed pipe section and the two exposed pipe ends were immediately bagged and appropriately labelled to further prevent any spread of contamination.

No work took place between the evening of March 18 and the issuance of the approved RWP/RER on March 20. Once work resumed following the issuance of the RWP/RER, numerous surveys were performed during the course of work. These surveys showed that there was never any spread of contamination, nor was any airborne radioactivity above applicable limits generated, even during hot work and grinding. Copies of the surveys are attached for reference.

5. The radiological safety precautions taken prior to and during the time the work was being performed.

During preliminary excavation work to uncover the source of leakage, water and soil samples were taken and analyzed, and found to be below applicable limits. Random samples of dirt being removed from the excavation were frisked, and no contamination was detected. Since none of the requirements for an RWP had yet been met, no RWP was required. However, a Rad Con technician was in almost constant attendance to monitor for changing conditions which might dictate the use of an RWP. None were encountered. All the work being performed was already within a posted Radiation Area and RCA. It was the intent of the Rad Con Department, in order to facilitate preparatory work to hold off on establishing special posting and RWP requirements until such time as either contamination was encountered or the pipe was ready to be cut, whichever came first. As soon as the hole in the pipe became accessible, smears were taken inside the pipe and no contamination above applicable limits was found. As of the close of the workday on Friday, March 16, an RWP had not been required.

Since the actual event in question (initial cutting of the pipe on the evening of March 18) occurred without an RWP and was not monitored by Rad Con, no special radiological precautions were taken during the cutting. However, it is felt that the conditions which existed at the time (i.e., inward flow of air and welder's gear) did provide some measure of protection.

Prior to the resumption of work, RWP #751-84 and RER #155-84 were issued for use on March 20. RER #163-84 was added onto the RWP on March 22, to address added scope of work. Basically, the RWP and RERs required the use of full protective clothing and respiratory protection (PAPRs), augmented by a portable HEPA-filtered exhaust ventilation system. The temporary enclosure which had been erected over the excavation was utilized as a contamination control barrier. Copies of RWP #751-84 and the two RERs are attached for reference as to specific requirements. All work performed after March 18 was controlled by these documents.

6. The controlling radiological and maintenance work procedures involved with the job.

The two primary procedures which should have been controlling in this situation are Station Procedure 105 titled "Conduct of Maintenance," and Station Procedure 915.12, titled "Radiation Work Permit". The stated purpose of Procedure 105 is "to provide standard administrative, management and radiological control practices for the planning and conduct of maintenance at Oyster Creek." The stated purpose of Procedure 915.12 is to provide an administrative method of controlling personnel access to RWP areas for the purpose of minimizing the total dose equivalent as low as reasonably achievable (ALARA) and working with maximum radiological safety."

7. The adequacy of the controlling procedures.

Station Procedure 105, "Conduct of Maintenance," contains clearly defined responsibilities for all personnel involved in the planning and execution of maintenance work, radiological and otherwise. There are detailed instructions for requesting, obtaining and using a Radiation Work Permit, when required. Station Procedure 915.12, "Radiation Work Permit", clearly defines the conditions which require the use of an RWP and contains detailed instructions for obtaining and using an RWP. It is felt that these procedures, as currently written, are more than adequate. For the period January 1, 1984 through May 20, 1984, the Maintenance and Construction Department completed over 2100 maintenance job orders, some involving radiological work and some not. In support of the effort, the Radiological Controls Department has written and issued 1150 RWPs during the same time period. With the single exception of the incident in question, the proper determination was made in all cases concerning the necessity for RWPs. The incident in question was an isolated occurrence that is not indicative of a programmatic problem caused by inadequate procedures.

8. The corrective actions taken or planned to prevent recurrence including the dates of these actions.

Immediate corrective actions taken at the time the incident was discovered were as follows:

A. The job was stopped and Radiological Controls management notified. An immediate hold was placed on any further work pending the issuance of a valid RWP/RER;

B. Surveys were taken to determine whether or not any spread of contamination had occurred. Contaminated items were properly identified and controlled.

C. Whole Body Counts were arranged for all workers involved.

These immediate actions were performed on the evening of March 18.

On March 20, an approved RWP/RER was issued to allow work to continue with the proper radiological precautions. On March 27, a formal critique of the incident was held by management with all involved personnel, including the individual making the allegation. At the critique, procedural requirements were reviewed and determined to be adequate as written. All attendees were asked if there were any remaining open items, questions or comments and there was no response. The critique would have been held earlier had it not been for the unavailability of key personnel. On March 28, the M&C Area Supervisor was counseled by his management for failure to submit an RWP for the job, and not following up on his initial request for an RER. These actions concluded the Company's investigation into the incident.

9. The radiological health effects on the workers involved in the job.

External whole body and extremity exposure received by the workers as a result of this incident were minimal. Dose rates on contact with the pipe were less than 2 mRem/hr. General area dose rates in the work area were less than 2 mRem/hr. None of the workers involved received any skin contamination as a result of the incident. Results of the Whole Body Counts performed on all five workers indicated that there was no detectable activity above MDA present, and, therefore, no significant ingestion of radioactive material by any of them. Based on the above facts, it can be stated that there were no adverse radiological health effects on any of the workers.

10. Perspective as to the need for an RWP, and the reasons why or why not, including potential interface difficulties between various GPUN Divisions.

It is felt that all the preparatory work which led up to the actual cutting of the pipe was properly performed without an RWP being required. As previously stated, none of the conditions which would have dictated the use of an RWP had yet been met, and the preparatory work was being closely monitored by Rad Con personnel.

There was information available which could mislead a maintenance supervisor to believe an RWP was not required for removing the pipe. Survey results did not indicate contamination above limits, either on the soil, in the water coming out of the pipe, or on the externals and internals of the pipe. Althought the Rad Con Department believed unknown radiological conditions existed inside the pipe which required an RWP, this was not clearly communicated to the maintenance supervisor. The maintenance supervisor did not specifically ask the Rad Con Department if an RWP was required and did not clearly communicate when the work was to be performed. The submittal of a Radiological Engineering Request (RER) misled the Radiological Controls Department to the conclusion that the maintenance supervisor realized unknown radiological conditions existed on the pipe internals. No intent by the maintenance supervisor, the workers or Radiological Controls to bypass procedural requirements or Radiological Controls rules was demonstrated. In fact, upon discovery of contamination, the workers reported promptly to Radiological Controls.

Concerning interface difficulties between GPUN divisions, it has already been pointed out that M&C routinely performs a very large volume of work and that Rad Con routinely issues and enforces a large number of RWPs in support of that work. This is done in an orderly fashion, in accordance with prescribed procedures and with the proper determinations made as to whether or not RWPs are required. The incident in question is considered to be an isolated instance of human error, and is not indicative of a programmatic interface problem between the two divisions nor of control of radiological work.

SUMMARY

The incident in question (cutting the pipe without an RWP) occurred on March 18, 1984. As soon as the error was discovered, timely and appropriate corrective actions were taken. No further work was allowed until an approved RWP/RER was issued. A formal critique of the incident was convened on March 27, 1984, well within the time period specified in Station Procedure 915.10. The critique concluded the Company's investigation into the incident.

Mr. Rayment stated in his letter that he unsuccessfully sought resolution to his concerns before writing the letter. The fact of the matter is that Mr. Rayment personally attended the critique meeting, and when asked if he had any unanswered concerns or open issues, he responded that he did not. Further, between the critique on March 27, 1984 and the date of his letter, May 1, 1984, he did not express any concerns to Supervision or Management in his own Department, nor did he approach anyone in Supervision or Management in the Radiological Controls Department. Mr. Rayment has an open invitation from the Vice President/Director of Oyster Creek to discuss any concerns that he may have at any time. He did not do this. He did not express his concerns to anyone in Corporate Management, including the GPUN Ombudsman.

Contrary to Mr. Rayment's statement, he did not utilize any of these avenues to express his concern for any issues he believed were not addressed.

Inter-Office Memorandum

Date April 12, 1984

GPU Nuclear

Subject Chemistry Sampling: Overboard Discharge Pipe Break

To C. J. Halbfoster

Location Oyster Creek

On March 14th, water was discovered coming up from the southwest corner of the ORW Building. The overboard discharge line is in this region and, since an overboard release was in progress, the overboard discharge was promptly stopped.

The first chemistry sample obtained was a water sample from the general area. Chemistry technicians were unable to collect a sample from the immediate vicinity of the water source. This liquid sample was within all requirements for a non-processed water release.

A liquid sample was obtained late March 15th during excavation. Maintenance was digging under the southwest corner of ORW to effect repairs. This sample showed Cesium-137 (Cs^{137}) activity below administrative limits of 20% of 10 CFR 20.

The results of the liquid samples are shown in Table 1. The results of the two (2) previous overboard releases are also included for comparison. The 20% of 10 CFR 20 limits for liquid releases are shown.

Maintenance personnel exposed the discharge piping, but observed no hole. Demineralized water was put through the line and the hole location was determined to be under the ORW Building.

Chemistry collected seven (7) soil samples during excavation of the area areound the discharge piping. Four (4) samples were approximately at the same elevation as the discharge piping. The sample locations are mapped on Attachment 1.

Table 2 contains the results of the radiological analyses. Sample Number 4 shows greater activity levels for both Co^{60} and Cs^{137}. The activity levels for these four (4) samples do not exceed 10 CFR 30 limits nor the administrative limit for Cs^{137} of 10 times 10 CFR 20 limits.

Chemistry collected three (3) additional samples approximately one (1) foot below the discharge piping. These samples (5-7) are mapped on Attachment 2.

Table 3 contains the results of the radiological analyses. The activity levels for these three (3) samples do not exceed 10 CFR 30 limits nor the administrative limit for Cs^{137} of 10 times 10 CFR 20 limits.

The somewhat greater activity levels (greater than 10% of limits) for Sample Numbers 4 and 6 are typical of soil in the Radwaste yard area. Table 4 illustrates activity levels from several soil samples from the north side of ORW.

Based on the above informaton, it can be concluded that no environmental release exceeding any imposed limits occurred as a result of the overboard discharge pipe break. These actions have been reviewed by the Plant Review Group (PRG), Messrs. Cowgill, Nimitz and Bellamy of the NRC and have been approved.

If you have any questions or comments, please contact me on Extension 4606.

Bradley Shumaker
Chemistry

BCS/CJH/mjw

Attach.

TABLE 1

LIQUID SAMPLES

Date	Sample No.	Description	Activity	µCi/ml
3-07	522-84	Overboard 3-14 225	< MDA	
3-07	518-84	Overboard 3-14 1335	< MDA	
3-14	571-84	Water in Ditch Between ORW Control Room & R.R. Air Lock	< MDA	
3-15	577-84	Water in Excavation of Discharge Piping	Cs^{137}	2.64E-6
-	-	20% of 10 CFR 20	Cs^{137}	4.0E-6

TABLE 2

SOIL SAMPLES

No.	Date	Sample No.	Activity μCi/gm Co^{60}	Cs^{134}	Cs^{137}
1	3-16	583-84	1.21E-5	-	6.88E-6
2	3-16	584-84	8.44E-6	-	7.40E-6
3	3-16	585-84	2.56E-6	-	1.53E-6
4	3-16	586-84	1.01E-4	4.07E-6	1.65E-4

TABLE 3

SOIL SAMPLES

No.	Date	Sample No.	Activity μCi/gm Co^{60}	Cs^{134}	Cs^{137}
5	3-16	590-84	1.47E-5	-	7.86E-6
6	3-16	591-84	4.45E-5	2.45E-6	8.70E-5
7	3-16	592-84	1.68E-5	-	7.01E-6

TABLE 4

NORTH OF ORW SOIL SAMPLES

FOR COMPARISON

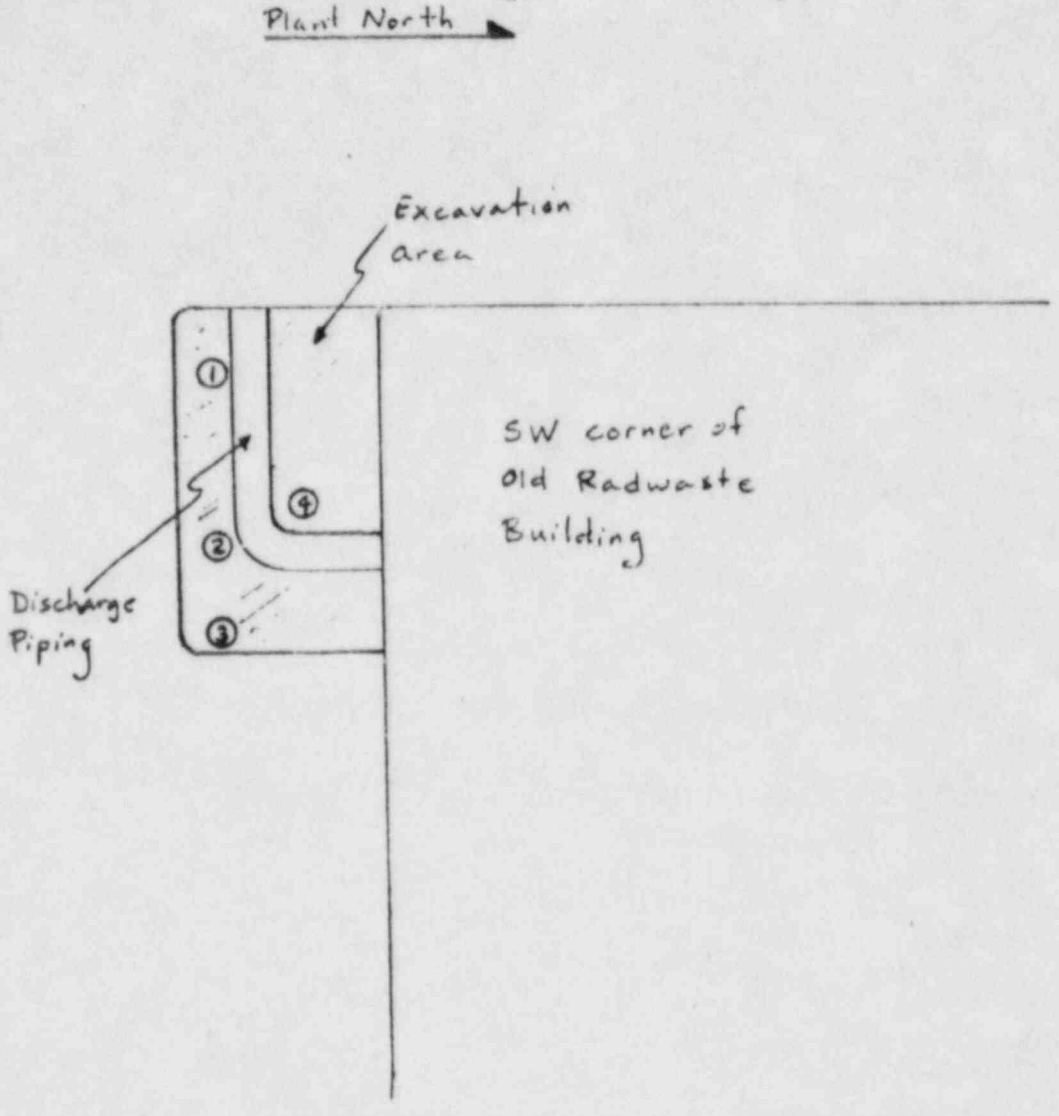
Sample Number	Activity μCi/gm		
	Co^{60}	Cs^{134}	Cs^{137}
2957-83	9.26E-5	3.15E-6	1.39E-4
2958-83	3.94E-6	-	8.91E-6
2959-83	9.01E-5	3.14E-6	1.87E-4
2960A-83	8.71E-6	1.58E-6	6.61E-5
2960B-83	8.30E-6	1.80E-6	6.51E-5
2961-83	5.39E-6	-	1.40E-5
2962-83	3.88E-6	-	1.51E-5
2965-83	4.44E-6	-	1.44E-5
2966-83	6.59E-6	-	1.56E-5
2967-83	3.11E-5	-	9.85E-5
2968-83	8.83E-6	1.85E-6	1.04E-4

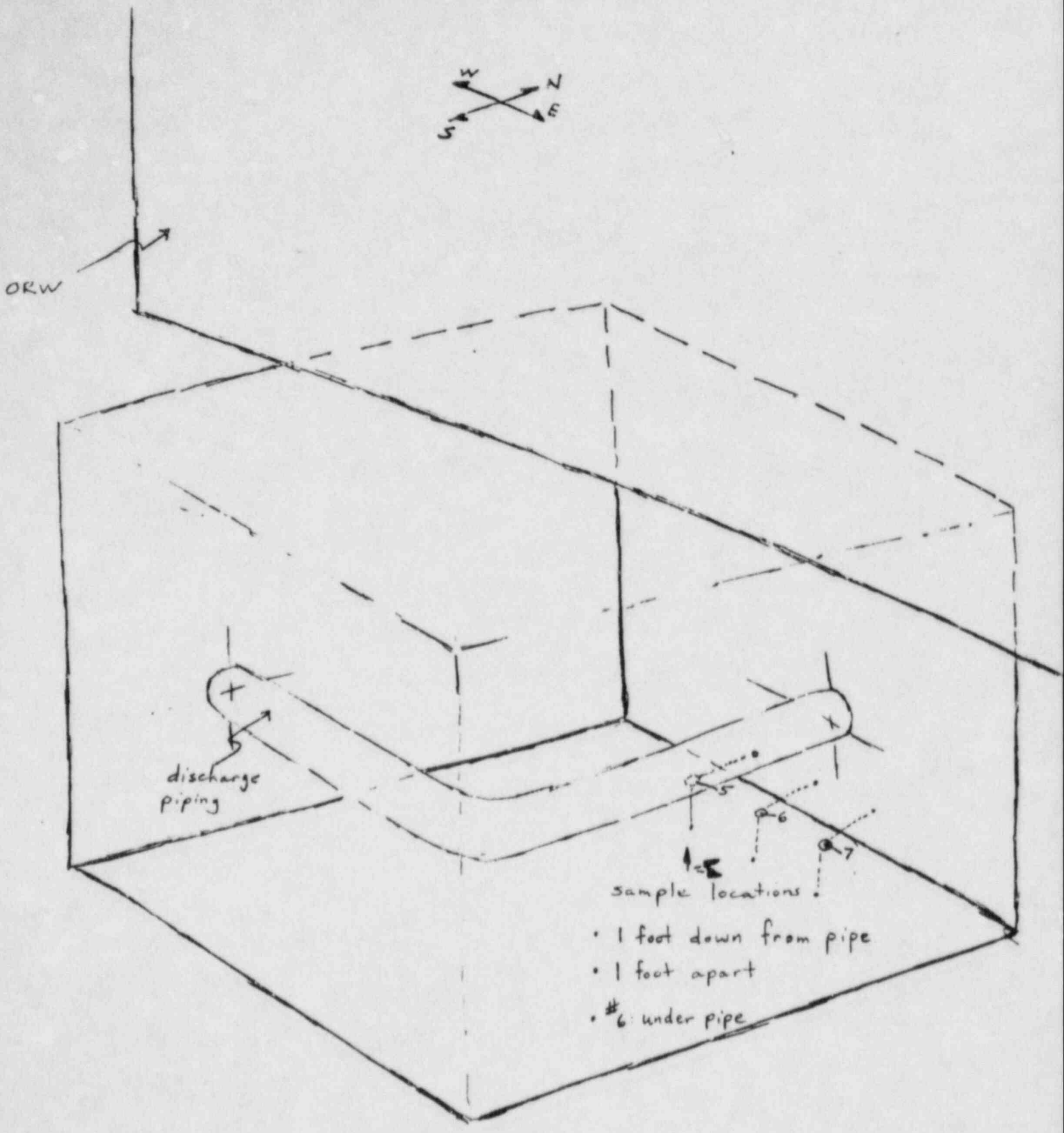
TABLE 5

Isotope	Limits	
	20% 10 CFR 20 (μCi/ml)	10 CFR 30 (μCi/gm)
Co^{60}	6.0E-6	5.0E-4
Cs^{134}	2.0E-6	9.0E-5
Cs^{137}	4.0E-6	2.0E-4*

* No 10 CFR 30 limit. This number represents 10 times 10 CFR 20 limit.

Attachment 1





Attachment 2