



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

December 19, 1990

The Honorable Peter H. Kostmayer
United States House of Representatives
Washington, D.C. 20515

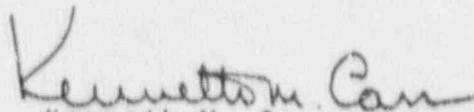
Dear Congressman Kostmayer:

The Commission has received your letter of October 1, 1990, relating to the quality of welds at the Seabrook Nuclear Power Station. We regret that you continue to express dissatisfaction with the Commission's response on these issues. I asked the staff to review the assertions and conclusions in your letter, focusing on the general issue of compliance of the licensee's review of Pullman-Higgins work with 10 CFR Part 50, Appendix B, and the evidence to support the conclusion that a 100 percent review of weld radiographs occurred. The staff's comments (enclosed) are consistent with previous responses, the information provided in NUREG-1425, and the information provided during the meeting at Seabrook on August 28 and 29, 1990, between members of the Congressional staff and the Nuclear Regulatory Commission Independent Review Team.

The Commission has expended considerable time and resources in responding to the many requests for information from your staff. We remain satisfied that weld quality at the Seabrook Nuclear Power Station is adequate to ensure the public health and safety. We note that the Inspector General has been reviewing our handling of this matter, and we will consider any new information his study may provide.

Commissioner Remick did not participate in the preparation of this response.

Sincerely,


Kenneth M. Carr

Enclosure:
Staff Comments

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PDR COMMS NRCC
CORRESPONDENCE PDR

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CHAIRMAN

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

December 10, 1990

The Honorable Nicholas Mavroules
United States House of Representatives
Washington, D.C. 20515

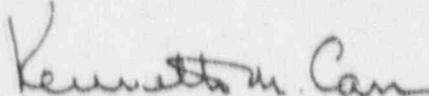
Dear Congressman Mavroules:

The Commission has received your letter of October 1, 1990, relating to the quality of welds at the Seabrook Nuclear Power Station. We regret that you continue to express dissatisfaction with the Commission's response on these issues. I asked the staff to review the assertions and conclusions in your letter, focusing on the general issue of compliance of the licensee's review of Pullman-Higgins work with 10 CFR Part 50, Appendix B, and the evidence to support the conclusion that a 100 percent review of weld radiographs occurred. The staff's comments (enclosed) are consistent with previous responses, the information provided in NUREG-1425, and the information provided during the meeting at Seabrook on August 28 and 29, 1990, between members of the Congressional staff and the Nuclear Regulatory Commission Independent Review Team.

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Commissioner Remick did not participate in the preparation of this response.

Sincerely,


Kenneth M. Carr

Enclosure:
Staff Comments



CHAIRMAN

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

December 19, 1990

The Honorable Edward J. Markey
United States House of Representatives
Washington, D.C. 20515

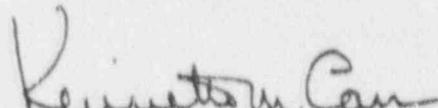
Dear Congressman Markey:

The Commission has received your letter of October 1, 1990, relating to the quality of welds at the Seabrook Nuclear Power Station. We regret that you continue to express dissatisfaction with the Commission's response on these issues. I asked the staff to review the assertions and conclusions in your letter, focusing on the general issue of compliance of the licensee's review of Pullman-Higgins work with 10 CFR Part 50, Appendix B, and the evidence to support the conclusion that a 100 percent review of weld radiographs occurred. The staff's comments (enclosed) are consistent with previous responses, the information provided in NUREG-1425, and the information provided during the meeting at Seabrook on August 28 and 29, 1990, between members of the Congressional staff and the Nuclear Regulatory Commission Independent Review Team.

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Sincerely,


Kenneth M. Carr

Enclosure:
Staff Comments



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20565

December 19, 1990

CHAIRMAN

The Honorable John F. Kerry
United States Senate
Washington, D.C. 20510

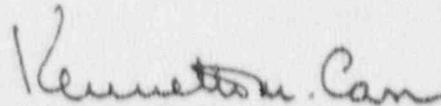
Dear Senator Kerry:

The Commission has received your letter of October 1, 1990, relating to the quality of welds at the Seabrook Nuclear Power Station. We regret that you continue to express dissatisfaction with the Commission's response on these issues. I asked the staff to review the assertions and conclusions in your letter, focusing on the general issue of compliance of the licensee's review of Pullman-Higgins work with 10 CFR Part 50, Appendix B, and the evidence to support the conclusion that a 100 percent review of weld radiographs occurred. The staff's comments (enclosed) are consistent with previous responses, the information provided in NUREG-1425, and the information provided during the meeting at Seabrook on August 28 and 29, 1990, between members of the Congressional staff and the Nuclear Regulatory Commission Independent Review Team.

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Sincerely,


Kenneth M. Carr

Enclosure:
Staff Comments



CHAIRMAN

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

December 19, 1990

The Honorable Edward M. Kennedy
United States Senate
Washington, D.C. 20510

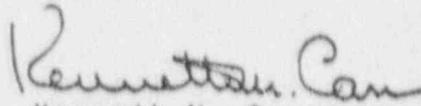
Dear Senator Kennedy:

The Commission has received your letter of October 1, 1990, relating to the quality of welds at the Seabrook Nuclear Power Station. We regret that you continue to express dissatisfaction with the Commission's response on these issues. I asked the staff to review the assertions and conclusions in your letter, focusing on the general issue of compliance of the licensee's review of Pullman-Higgins work with 10 CFR Part 50, Appendix B, and the evidence to support the conclusion that a 100 percent review of weld radiographs occurred. The staff's comments (enclosed) are consistent with previous responses, the information provided in NUREG-1425, and the information provided during the meeting at Seabrook on August 28 and 29, 1990, between members of the Congressional staff and the Nuclear Regulatory Commission Independent Review Team.

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Commissioner Remick did not participate in the preparation of this response.

Sincerely,


Kenneth M. Carr

Enclosure:
Staff Comments

NRC Staff Comments on October 1, 1990 Letter
from Representatives Kostmayer, Markey, and Kavroules,
and Senators Kennedy and Kerry

Introduction

Three points related to the Seabrook weld program need to be reiterated before responding directly to the questions raised in the letter from the five Members of Congress, dated October 1, 1990, in order to clarify the NRC staff position and increase Congressional understanding of the 100% radiograph review function at Seabrook Station:

I. "Review" as it Relates to the Yankee Atomic Electric Company (YAEC) Review of Pullman-Higgins (P-H) Weld Radiographs

The term "review," as it related to the YAEC review of the final P-H weld radiographs, was a YAEC surveillance of P-H weld film and was accomplished as a part of the licensee's Level 2 QA surveillance program as described in the Seabrook Final Safety Analysis Report (FSAR). This review was conducted in accordance with 10 CFR 50, Appendix B requirements. Details of this surveillance program were presented formally in written responses to Congressional letters and informally in meetings with Congressional staff members. Attachment 1 contains excerpts from previous correspondence that explains the review/surveillance activity.

II. Scope of the YAEC Review of P-H Weld Radiographs

Surveillance programs are normally performed on a sampling basis with a scope of much less than 100%. The NRC does not mandate the scope of a surveillance activity; however, it expects the scope to be at a depth and frequency that ensures the quality of the activity being reviewed. Based on the results of surveillance activities, the licensee may decide to increase the frequency of the review up to and including a 100% review and may even require a 100% re-review of all activities which have already occurred. This was, in part, the case with the licensee's review of final P-H weld radiographs at Seabrook. Following the YAEC identification of repeated problems in late 1983 and early 1984 with the adequacy of P-H's review of radiographic film, the licensee made a determination to proceduralize the requirement to perform a 100% review of the final P-H weld film. It was not necessary, in this case, to re-review all previous P-H weld film because the licensee had already been performing a 100% review. In fact, it was the results of this 100% review that prompted the licensee to initiate the procedural requirement.

Attachment 2 contains excerpts from previous correspondence that discusses the scope of the YAEC review in greater detail.

III. Importance of the YAEC 100% Review In Relation to Overall Assurance of Weld Quality at the Seabrook Station

The YAEC 100 percent reviews were one source of NRC assurance of weld quality at the time of the issuance of the Seabrook full power operating license. The ASME Code-required reviews by the piping contractor of in-process and completed welding activities were additional contributors to the assurance of weld quality. ASME Code-required hydrostatic testing of the systems to pressures greater than design provided further evidence of weld quality as did the preservice inspection (PSI) results for specific ASME welds. NRC independent radiographic inspection of welds, review of process and radiograph records, review of radiograph film, and observation of in-process welding also offered the opportunity to determine whether licensee weld quality controls were working effectively.

Detailed explanations of the findings of NRC inspection activities before and after the license issuance are documented in the September 21, 1990 response to Congressman Kostmayer's letter dated July 30, 1990, and in the September 21, 1990 response to the August 9, 1990 letter from the five Members of Congress. These documents are contained in Attachment 3 to this Enclosure.

Responses to Specific Questions

Question 1

The Commission states that the performance of a 100% review of radiographs was an activity affecting quality; i.e., it was necessary to assure the quality of the Seabrook welds. This being the case, we would expect that the Commission would have required this review to be conducted in accord with the requirements of Appendix B. In the very next breath, however, the Commission states that the 100% review was not specified by a regulatory code requirement, but was voluntarily implemented, and that these activities were in excess of Appendix B requirements. We cannot reconcile these two approaches. How can an activity be essential to the quality of the plant and at the same time be outside the scope of Appendix B?

Response

As discussed in the introduction, the review/surveillance of radiographs by the licensee's QA organization was an activity affecting quality, which was conducted in accordance with 10 CFR 50, Appendix B under the auspices of the licensee's Level 2 QA Surveillance program as described in the Seabrook FSAR. The NRC expects the licensee to adjust the scope of surveillance activities as necessary to ensure quality. The licensee did this and determined that enough problems existed to justify continued implementation of 100% overview. At this point, the YAEC 100% review of final P-H weld film was proceduralized by the licensee based on their understanding of the problems with P-H review of weld film. A re-review of the P-H weld film that was final at the time the YAEC 100% review was proceduralized was not considered necessary since the 100% review had been initiated at the start of the welding program. In fact, it was this 100% review which identified the P-H film review problems. As can be seen from these facts, the problem identification resulted from implementation of Appendix B and the corrective action that resulted was consistent with Appendix B. Details concerning the YAEC 100% review have been discussed in previous correspondence and are contained in Attachments 1 and 2 of this enclosure.

Question 2

Why is the Commission unable to produce a straightforward answer? If the contemporaneous documentary record is insufficient to support the conclusion that a 100% review was conducted, then the Commission should so state. If the contemporaneous record is sufficient to support the conclusion that a 100% review occurred, what accounts for the persistence of these qualified and ambiguous descriptions of the process?

Response

This issue has been explained in previous correspondence and in meetings with Congressional staff members. The NRC staff believes the licensee's position that the YAEC review of final P-H weld film was 100% from the beginning. This belief is based on extensive inspection effort as documented in inspection reports and NUREG-1425. To this point, no evidence has been identified which alters the licensee's position and the Commission's belief that the review was 100%. The response to Question 5 also addresses this issue.

Question 3

On the one hand, the Commission's response states, "the NRC staff initially considered the conduct of the YAEC radiograph review program at a '100%' level to be a conservative licensee measure to comprehensively address problems identified in the QA Level 1 contractor programs, not a specific program requirement." Are we to understand from this statement that the NRC staff was aware of the purported 100% review prior to December 1983? If so, why was the creation of this program not addressed in NRC inspection reports; why was this program not required to be conducted in strict compliance with the requirements of Appendix B; why did the licensee not file a report, pursuant to the requirements of 10 CFR 50.55(e), on the Pullman-Higgins (the Seabrook weld contractor) program breakdown involving hardware defects; and, why did the NRC not take enforcement action in response to the licensee's failure to file such a report? The reporting failures followed by the NRC not taking enforcement action of course deprived the Seabrook intervenors of important information to which they were entitled.

On the other hand, the NRC position to date has been that the NRC can trace back its awareness of the 100% review only to December 1983. If this is true, what then is the basis for the Commission's confidence that "NRC inspections would have evaluated the effectiveness of any reduced level of overview?" How could NRC inspections have evaluated the effectiveness of an overview process the very existence of which was unknown to the NRC at the time?

Response

The YAEC review program was conducted in accordance with 10 CFR 50, Appendix B as discussed in the response to Question 1.

As explained in the response to Dr. Myers' request dated July 19, 1990, and in NUREG-1425, Sections 2, 14 and 17, the Independent Review Team (IRT) evaluated the licensee's program for 10 CFR 50.55(e) reportability. The IRT concluded that no significant breakdown of the licensee's QA program occurred relative to the P-H welding issue and, therefore, the issue was not reportable under 10 CFR 50.55(e). Consequently, since the staff concluded that the licensee did not violate the requirements of 10 CFR 50.55(e), enforcement action was not appropriate.

As discussed in the introduction and in the previous response to Congressional requests, some of which are contained in Attachment 1, the NRC was continually evaluating the effectiveness of the licensee's QA programs, including the welding QA program. Based on the results and conclusions of inspections, such as the 1984 Construction Appraisal Team (CAT) inspection, the NRC was aware of the importance of the licensee's overview and was monitoring the licensee's ability to assure weld quality.

Furthermore, as has been previously explained in responses to Congressional staff questions, evidence of NRC awareness that YAEC was reviewing Pullman-Higgins radiographs dates back to mid-1982, as documented in the Region I CAT inspection report, 50-443/82-06. The December 1983 date relates to a

Congressional question of documented evidence of NRC awareness that the review was a 100% scope activity. Even this documented evidence (i.e., the January 1984 Region I memorandum) indicates that "YAEC NDE personnel had been and still do conduct 100% review of contractor accepted radiographs" (emphasis added). What is meant by the underlined statement quoted in Question 3 above is that NRC inspections are intended to evaluate the effectiveness of licensee QA program activities, at whatever level of overview they are conducted. If something less than a 100% review by YAEC was found to be effective, such a sample program would have been acceptable to the NRC.

Question 4

In arriving at its conclusions concerning the 100% review, the Commission has inferred that the YAEC reviewer's signature on a specific Radiographic Inspection Report (RIR) constitutes proof that the named YAEC inspector reviewed radiographs of the associated weld. What evidence has the Commission relied upon to support this judgement?

Response

The response to Dr. Myers' request dated October 17, 1990, contains detailed explanations regarding the above question (Attachment 4 to this Enclosure). The following conclusions are excerpts from the response to Dr. Myers:

"Therefore, although no documents clearly delineate either the conditions or what was being approved by the YAEC reviewer when he signed the RIR, the available evidence suggests that he was accepting the RIR as a quality document and accepting the disposition of the RIR as to the acceptability of the radiographic weld quality. As noted above, this position was confirmed by the NRC Independent Review Team, by NRC inspection follow-up of issues raised by the Congressional staff, and by discussions with licensee personnel directly involved in the YAEC radiograph review process."

"Therefore, the NRC believes that the Master Checklists utilized in the YAEC surveillance of radiography activities were used both to verify procedural adherence, as well as to conduct an additional radiographic review of the film to confirm Code compliance. The basis for this position, as is questioned in the above request, is the NRC review of the various Master Checklists, discussions with some of the YAEC personnel involved and their use in the conduct of surveillances, and the fact that several of the surveillance reports themselves (i.e., the QA record to which the Master Checklist are attached) clearly identify that YAEC reviews of radiographs for weld quality were conducted."

Question 5

In fact, the Commission's conclusion that the Yankee Atomic Electric Company (YAEC) conducted a 100% review of weld radiographs beginning in 1979, and that this review continued "throughout the piping installation," is not supported by the preponderance of evidence. To the contrary, our staffs have concluded that the preponderance of evidence is clearly insufficient to support the conclusion that, prior to late 1983, YAEC conducted a 100% review of radiographs. We have been informed that:

- a. No procedures have been identified that, prior to 1984, required a 100% review.
- b. No document describing the preconditions for a YAEC certification signature on Radiographic Inspection Reports has been identified.
- c. Radiographs associated with Radiograph Inspection Reports containing a YAEC signature were rejected after the date of the YAEC signature of approval, indicating the final YAEC safety net had holes in it.
- d. During the recent NRC inspection, the YAEC construction Quality Assurance manager informed NRC staff that initial radiograph reviews started late in 1983; interview notes prepared by NRC staff show no mention by this manager of a 100% radiograph review.
- e. Surveillance reports, which the licensee suggests provide evidence of the 100% reviews, actually substantiate that YAEC reviewed only a small fraction of radiographs. The documentation of YAEC radiograph reviews, even those conducted during the post-1983 time frame, is sparse. Moreover, during the period these surveillances were being conducted, the backlog of film packages grew to about 2000 before it was discovered by the licensee sometime in 1983. This backlog could hardly have accumulated and escaped notice until the 1983 timeframe if YAEC was indeed conducting a 100% review of radiographs. [An alternative and equally disturbing explanation of the backlog is that these radiograph packages had been returned by YAEC to the welding contractor without the required documentation.]

Response

The NRC's conclusion that the Yankee Atomic Electric Company (YAEC) conducted a 100% review of radiographs beginning in 1979, and that this review continued throughout the piping installation, was based on the best evidence available. The points you raise here do not disprove that YAEC conducted a 100% review. With respect to your specific points:

- a. This statement is true. The basis for the staff's understanding that the 100% review had occurred prior to the procedural requirement in 1984 is set forth in the response to Question 2 of this Enclosure and is discussed further below.

- b. This statement is also true. This issue is addressed in detail in the response to Question 4 (see also Attachment 4 to this Enclosure).
- c. The fact that such situations have arisen was noted and discussed in previous responses to Congressional staff questions. As an example, in an August 6, 1990 request from Dr. Myers, this question was raised with a listing of several RIRs as examples. The staff's response to this request is contained in Attachment 4 to this enclosure. The conclusion of this response is as follows:

"In summary, four of the welds raised as examples in this question represent cases where the RIRs were indeed signed off by YAEC prior to the issuance of DR 527. In each case, the corrective action was completed prior to YAEC acceptance of the radiographic package and sign-off of the RIR. The tabulation and consideration of these particular deficiencies (even though they had already been corrected) in the DR 527 discrepancy categories was acceptable because, as stated above, generic corrective action was expected of Pullman-Higgins."

- d. Although the inspection field notes provided as Attachment 2 in the response to the August 9, 1990 letter from the five Members of Congress indicate that Mr. McDonald believed the 100% review of P-H weld film began in late 1983, later conversations between the IRT members and Mr. McDonald revealed that he did in fact recall the review to be 100% from the beginning. Also, during the meeting at Seabrook on August 28 and 29, 1990, between the IRT members, Congressional staff members, and members of the licensee's staff, Mr. McDonald was asked directly when the 100% review began, and he replied that the review was 100% from the beginning.
- e. The YAEC initials on the many RIRs reviewed by the NRC offer assurance that 100% of the radiographs were reviewed. As discussed in the NRC staff response to Dr. Myers' October 17 request, ". . . it was never the intention of YAEC to document on surveillance reports each and every radiographic film package reviewed. The use of surveillance reports as such would have been redundant to the YAEC practice of signing each RIR..."

The fact that there was a backlog of radiographs to be reviewed does not relate in any way to the performance of a 100% review by YAEC. It simply meant that the radiographs had not yet been turned over to YAEC for review. The alternative suggested that the final radiograph packages had been returned by YAEC to the welding contractor without the required documentation is not a plausible explanation. As evidenced by the Pullman-Higgins flowchart, attached to a May 1983 memo, which was also provided to Dr. Myers, YAEC review of radiographs was routinely accomplished after the Pullman-Higgins Level III review. Since a substantial portion of the backlog was caused by the fact that no Pullman-Higgins Level III had yet reviewed the film, the suggestion that YAEC would conduct an informal final acceptance review is not consistent with the chronology of the signatures on the RIRs.

Question 6

The Commission's response slides over the question of whether the purported YAEC 100% review satisfied 10 CFR 50, Appendix B, Criterion V which states that activities affecting quality shall be prescribed by documented instructions, etc. The Commission agrees that the purported 100% review as an activity affecting quality and one which the NRC staff believed necessary if the Seabrook licensee were to meet the NRC's requirements. Contrary to the requirements of Criterion V, however, the purported 100% review was not prescribed by documented instructions.

Response

The YAEC review was conducted in accordance with 10 CFR 50, Appendix B under the auspices of the licensee's QA Surveillance program as described in the Seabrook FSAR and as such was governed by the licensee's surveillance procedures. Details regarding the program and the governing procedures are contained in the response to the Dr. Myers May 29, 1990 request; excerpts from NUREG-1425, page 2-2; and the response to the August 9, 1990 letter from the five Members of Congress. Each of these documents is contained in Attachment 1 to this Enclosure. Also as discussed in the introduction, the 100% scope of the review was not proceduralized until such time as the problems identified by the review dictated this form of corrective action.

Question 7

Criterion XVII of 10 CFR 50, Appendix B requires that records shall be maintained to furnish evidence of activities affecting quality. The records of the purported 100% review, as noted above, are sparse at best and do not satisfy the requirements of Criterion XVII.

Response

The document which provides evidence of the YAEC review of P-H weld film is the final RIR, which is attached to the weld package stored in the vault. Details are discussed in the response to the August 9, 1990 letter from the five Members of Congress, which is contained in Attachment 1 of this Enclosure. The following is an excerpt from the response to the August 9, 1990 letter:

"The Radiographic Inspection Reports, which are retrievable for each weld requiring radiography, represent not only complete evidence of the film review but also record the acceptable results of these reviews in accordance with 10 CFR 50, Appendix B, Criterion XVII. These RIRs, supported by the actual radiographs, were maintained as QA records and provide sufficient documentary evidence of both the radiographic quality of the welds and the completeness of YAEC overview program."

Question 8

Moreover, the Commission's claim that the purported 100% review "was in excess of the ASME Code, the ANSI B31.1 Code, and 10 CFR 50, Appendix B," contradicts the fact, admitted by the NRC, that the review was essential to assure weld quality. Failure to reconcile these conflicting points papers over the YAEC failure to comply with Appendix B in the conduct of the purported 100% review, to the extent any such review was conducted.

Response

This question raises the same issue addressed in the response to Question 1.

Question 9

Further, the Commission is not convincing in its claim that NRC inspections conducted during the course of Seabrook construction provide a basis for confidence in weld quality. For example, the documentation deficiencies and weld defects identified by the recent NRC inspection, which had not been identified in previous NRC inspections, raise questions as to the effectiveness of such previous inspections. Moreover, confidence in the NRC inspection process is undermined by the fact that for the period prior to December 1983 there is no documentary evidence of NRC staff awareness of the purported 100% radiograph review.

Response

The details associated with the NRC inspection of the Seabrook Station during the construction period are discussed in the September 21, 1990 response to Congressman Kostmayer's July 30, 1990 letter, which is contained in Attachment 3 of this Enclosure. Additional information involving the NRC's inspection activities at the Seabrook Station is discussed in the September 21, 1990 response to the August letter from the five Members of Congress, which is contained in Attachment 3.

Question 10

The Commission was asked to provide a coherent and comprehensive description of the YAEC review's purpose and duration, documents subject to this review, review procedures, record keeping requirements, and procedures for handling deficiencies. Neither the September 21 response nor NUREG-1425 provides such a description.

Response

The various inspection reports, NUREG-1425, and correspondence both written and oral between the NRC and the five Members of Congress and their staffs have provided a coherent and comprehensive description of the above listed items. Succinctly summarized descriptions follow:

- o The YAEC review's purpose was to assure weld quality.
- o The duration of the review was for the entire length of the project.
- o Documents subject to the 100% review included radiographs and associated RIRs. These and other applicable welding records were subject to reviews by licensee audit and surveillance plans.
- o Review procedures were contained in the audit and surveillance plans and for ASME Code related audits, closely followed the requirements of the Code imposed on the contractor. Typical checklists have been sent to Dr. Myers in response to his May 29, 1990 request for information.
- o The recordkeeping requirements for the audits and surveillances were consistent with the standards committed to in the FSAR.
- o Different forms and associated implementing procedures were used to document deficiencies at the site. These deficiency forms and procedures were a function of the organization involved. It can be plainly stated that each of these deficiency procedures required that the deficiency be identified, tracked, corrective action identified, and corrective action completed.

SEPTEMBER 1, 1990 RESPONSE TO THE AUGUST 9, 1990 LETTER FROM THE FIVE CONGRESSMEN
(4 sheets)

Question 1:

Is it the Commission's position that the YAEC 100% review was an activity affecting quality? If so, under 10 CFR 50, Appendix B of the Commission's regulations, what documentation of this review is required to be maintained?

Response:

The Yankee Atomic Electric Company (YAEC) 100% radiograph review was an activity affecting quality. The required documentation is that which is needed to show weld quality. These matters are further discussed below.

1.4 Quality Aspects

The following quality assurance (QA) program excerpt relates to the design and construction of Seabrook Station and is from the Final Safety Analysis Report (FSAR), which is required in accordance with 10 CFR 50.34 to include a discussion of how the applicable requirements of 10 CFR 50, Appendix B, are satisfied.

The YAEC program for quality assurance normally involves three control levels:

Level 1 - Quality control by vendors, constructors and United Engineers and Constructors (UE&C) on the activities they perform, [and] by YAEC on startup activities. This includes reviews, inspections and tests.

Level 2 - Surveillance of design, fabrication and construction activities, including Level 1 Quality Control. Contractors provide this level for the design and procurement phases. UE&C and YAEC Nuclear Services Division (YNSD) provide additional surveillance on site construction activities.

Level 3 - Audits by YAEC QA Department of activities performed by Level 1 and 2 organizations.

Assurance by YAEC that contractor programs are properly implemented is accomplished, in part, by surveillance and audits at the construction site by YAEC QA representatives.

The YAEC program for the review of radiographs supplied by Pullman-Higgins (P-H) and other contractors and vendors was a surveillance activity which, as discussed above, was a Level 2 QA program activity affecting quality. Concurrent with the start of radiographic examinations of piping in 1979, YAEC began an overview of all P-H pipe weld film with the intent to reduce the 100% overview when confidence in P-H's ability to properly identify and correct deficiencies had been obtained. The overview continued

throughout the piping installation and from all indications appeared to have resulted in YAEC performing a 100% overview on all P-H final pipe weld radiographs. The 100% scope and application of this program was not specified by a regulatory or code requirement but was voluntarily implemented by YAEC to provide confidence that equipment, structures, and systems will perform satisfactorily in service. It is in this context that the NRC Independent Review Team (IRT) documented the following:

These 100-percent inspection activities were in excess of the ASME Code, the ANSI B31.1 Code, and 10 CFR Part 50, Appendix B requirements normally employed at a construction site.

As pointed out in the cover letter transmitting these Congressional questions to the NRC, the IRT also concluded that:

These additional overviews needed to be performed in order to identify deficiencies missed by the piping contractor.

A similar NRC conclusion was reached in 1984 based on the nondestructive examination (NDE) assessment results identified during the NRC Construction Appraisal Team (CAT) inspection. In a March 15, 1990 letter to Congressman Kostmayer in response to his questions regarding the CAT inspection report (IR 50-443/84-07), the NRC staff noted that:

In documenting the difference between the radiographic film which had been reviewed by the applicant and that which had not, the CAT inspectors specifically highlighted the fact that the radiographic review process would have represented a regulatory concern had it not been for the applicant's review process. Hence, this area of inspection was not listed as one where either potential enforcement actions or significant weaknesses were identified.

The NRC staff considered the YAEC radiograph review program to be an activity affecting quality commencing with its implementation as a QA program Level 2 activity. Further, since surveillances are normally planned as sampling activities, the NRC staff initially considered the conduct of the YAEC radiograph review program at a "100%" level to be a conservative licensee measure to comprehensively address problems identified in the QA Level 1 contractor programs, not a specific program requirement. Had the licensee chosen to implement less than a 100% review, no NRC regulation or code requirement would necessarily have been violated. However, ongoing NRC construction inspections, like the CAT inspections and Region I NDE Van inspections, would have evaluated the effectiveness of any reduced level of overview and any quality inadequacies identified would have been considered for enforcement action. The licensee, in this case, voluntarily adopted a program of radiograph review for 100% of the film after it was turned over by Pullman-Higgins. In May 1984, YAEC proceduralized the scope and performance of the film review activities it had been conducting as surveillances.

Thus, the documents provided to Congress evidencing NRC cognizance in December 1983 of a 100% review of contractor radiographs were consistent with both earlier inspection records (e.g., IR 50-443/82-06) and subsequent inspection reports (e.g., the CAT inspection in 1984) in acknowledging and assessing the effectiveness of the licensee's radiograph reviews. Whether the NRC inspection records prior to and after December 1983 document the YAEC film review program as a 100% effort or not indicates neither a conflict nor inadequate licensee performance. In support of this position is the after-the-fact IRT assessment which concluded in NUREG-1425 that:

The 100-percent overview performed by the licensee's agent, YAEC, was an effective program for radiographic film interpretation, in that it successfully found and required the contractor to correct the missed deficiencies.

I.B Documentation Aspects

10 CFR 50, Appendix B, Criterion XVII requires that sufficient records shall be maintained to furnish evidence of activities affecting quality. At Seabrook, the essential sufficiency of the weld records was found during construction and by after-the-fact NRC review. Many documents, including surveillance reports, deficiency reports, deviation notices, management action requests, immediate action requests, controlled speed letters, non-conformance reports, and audit reports related to the YAEC radiograph review program, were classified as QA records. However, in accordance with the procedural requirements of the YAEC "QEG NDE Review Group" procedure issued in May 1984, Radiographic Review Requests (YRT-1s) and Radiographic Review Summaries (YRT-2s) should have been controlled and retained as QA records, but were not. This omission was caused by the licensee decision to treat the YRT form usage as an administrative control rather than a QA record activity. The licensee determined that, since evidence of the YAEC 100% review of P-H radiographs was provided by YAEC reviewer signature or initials on the Radiographic Inspection Reports (RIRs), retention of the YRT forms was redundant and unnecessary. The NRC staff agreed that the annotated RIRs would meet the requirement for documenting weld quality. However, since the procedural requirement to retain the YRT forms as QA records was never revised, a procedural violation was identified. The NRC staff evaluated this violation in accordance with the NRC Enforcement Policy (10 CFR Part 2, Appendix C, Section V.A) and documented this inspection finding in Region 1 IR 50-443/90-12.

The Code of Federal Regulations, in particular 10 CFR 50, Appendix B, does not mandate the specific records which must be maintained on safety-related pipe welding or repair welding. A commitment in this regard is documented in the Seabrook Station Final Safety Analysis Report (FSAR), which indicates general consistency with USNRC Regulatory Guide 1.88, Revision 2. Regulatory Guide 1.88, titled "Collection, Storage, and Maintenance of Nuclear Power Plant Quality Assurance Records," endorses American National Standards Institute (ANSI) Standard ANSI N45.2.9-1974 for quality assurance records associated with nuclear power plants.

Additionally, the safety-related piping at Seabrook Station was generally installed in accordance with the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, 1977 edition through the Winter 1977 addenda. The ASME Code (Section III, Subsection NA) identifies general requirements for quality assurance records.

For welding and weld repair activities on the safety-related piping installed at Seabrook Station, the quality records must include the final results of the code-required nondestructive examination (including final radiographs, where RT is required). The results of such radiographic examinations were documented on the RIRs. As noted above and in responses to Congressional staff members on this subject, the evidence of the YAEC review of radiographs is provided by the YAEC reviewer signature or initials on the RIRs. This was demonstrated during the reviews of final P-11 RIRs by the IRT, in that each RIR consistently included the YAEC reviewer's signature or initials. The Radiographic Inspection Reports, which are retrievable for each weld requiring radiography, represent not only complete evidence of the film review but also record the acceptable results of these reviews in accordance with 10 CFR 50, Appendix B, Criterion XVII. These RIRs, supported by the actual radiographs, were maintained as QA records and provide sufficient documentary evidence of both the radiographic quality of the welds and the completeness of the YAEC overview program.

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(1 sheet)

Additionally, in conformance with 10 CFR Part 50, Appenrix B, Criterion II, the licensee must establish a quality assurance (QA) program requiring that activities affecting quality be accomplished consistent with their importance to safety, and also in compliance with the specified requirement, that is, the radiographic procedure. The criterion also required that the licensee regularly review the status and adequacy of the QA program. The review can consist of audits, surveillances, sample inspections, 100-percent overviews, or a combination of these--whatever has been deemed necessary to ensure that the required quality is achieved.

To ensure achievement of quality, the licensee's agent for the administration of the QA program at Seabrook Station, that is, YAEC, determined that it was necessary to perform an overview inspection of P-H pipe weld radiographs. YAEC performed the review within the framework of its QA surveillance program by requiring experienced film reviewers to inspect and interpret all P-H pipe weld radiographs of the finished weld, as well as to review samples of in-process pipe weld radiographs. Before April 1984, the review was performed against the P-H procedure using a detailed checklist per YAEC Procedure 3. After April 1984, this procedure was changed to YAEC Procedure 7, and YAEC Procedure 5 was issued to provide more formal details for the film review. This overview effort was added to routine, periodic YAEC QA audits and surveillances of the welding and NDE processes. The team's review of YAEC audit and surveillance reports is discussed in Section 3 and Appendix 8 to this report.

From the start of the piping fabrication and NDE processes to about mid-1982, P-H pipe weld film packages found unacceptable during YAEC review of film for acceptance were informally returned to P-H for correction. The unacceptable conditions were documented on the QA surveillance report, although one deficiency report (DR-037) documenting unacceptable film, issued in January 1980, was located in the licensee's records. After mid-1982, P-H pipe weld film packages, found unacceptable during YAEC review for acceptance, were returned to P-H for correction, and a DR or deviation notice (DN) was routinely issued in most cases. The exceptions to this included some administrative-type rejects that were easily correctable under the P-H program and did include some instances in which a controlled speed letter (CSL) was used, as provided in Field Quality Assurance (FQA) Manual, Procedure 9 (see Section 3 for further details).

Regardless of the mechanisms used, after any film discrepancies were identified by YAEC, the films were then returned to P-H for disposition and were re-reviewed by YAEC following corrective action by P-H. Under the P-H program, any films rejected by the YAEC overview were required to be evaluated and dispositioned in accordance with P-H's QA program requirements, and these actions were subject to YAEC's review and acceptance. If weld quality was defective, a nonconformance report (NCR) had to be issued per P-H Procedure XV-2. The team observed numerous instances throughout the piping fabrication period where P-H or UE&C issued NCRs to document and disposition nonconforming welds found by or resulting from the YAEC overview program. NCRs were also issued for similar conditions found by P-H reviews.

Thus, concurrent with the start of radiographic examinations of piping in 1979, YAEC began an overview of all P-H pipe weld film with the intent to reduce the 100-percent overview when confidence in P-H's ability to properly identify and correct deficiencies had been obtained. The overview continued throughout the piping installation and appeared to have resulted in YAEC performing a 100-percent overview of all P-H final pipe weld radiographs.

RESPONSE TO DR. H. MYERS' REQUESTS OF MAY 29 AND JUNE 6, 1990

(2 sheets)

Request 1 (May 29, 1990):

Please provide prior to COB, Friday, June 1 the procedures that, prior to implementation of Procedure #5 in May 1984, governed the YAEC 100% radiograph review. This request encompasses procedures that mandated the review. It also encompasses procedures that specified and controlled the methodology of the review, the manner in which the review of specific film packages would be recorded and reported, and the manner in which deficiencies would be handled.

Response:

Prior to May 1984, no procedural requirement mandated YAEC 100% review of safety-related radiographs. Such reviews were conducted as surveillances governed by a YAEC Field Surveillance Procedure. Surveillances are not normally intended to be 100% review or inspection efforts. However, with respect to Pullman-Higgins field weld film packages, the surveillance effort encompassed a 100% radiograph review as the film was turned over for YAEC record vault storage. Although the surveillance reports documenting such film review activities were not required to list each weld, evidence of the YAEC review of Pullman-Higgins, code-required radiographs has always been provided by YAEC reviewer signature or initials on the Radiographic Inspection Reports (RIRs). That began when the first film packages were turned over by Pullman-Higgins to YAEC in 1979. Therefore, while the requirement for a 100% YAEC radiograph review was not proceduralized until May 1984, the final RIR record for each weld should provide evidence of the review by YAEC. NRC inspection has not identified any welds for which YAEC radiographic review was not conducted.

Prior to the implementation of the YAEC "QEG NDE Review Group" Procedure No. 5 in May 1984, YAEC radiographic review activities were governed by YAEC Field Surveillance Procedure No. 3. A copy of Revision 7 to this procedure (the revision in effect at the time the YAEC Field QA Manual was updated in April 1984, when the QEG NDE Review Group Procedure No. 5 was written) was express-mailed to the NRC EDO office for delivery to Dr. Myers. Included with the procedure were some YAEC Field QA Group Surveillance Reports, intended to serve as examples of the way the radiography review was conducted and documented. With regard to the above question concerning the methodology and manner of review, it should be noted that a Master Checklist, provided with each surveillance report, established the criteria used by the YAEC QA personnel performing the surveillance. The parenthetical references (e.g. T-270, SE-94) documented with the Master Checklist criteria refer to the applicable paragraphs or sections of the ASME Boiler and Pressure Vessel Code, Section V, as they relate to radiographic requirements and standards.

YAEC Field Surveillance Procedure No. 3 governed surveillance activities of the YAEC Field QA Group during Seabrook construction. That procedure specified general programmatic and documentation requirements, while the appropriate

Master Checklist provided the specific technical inspection details. With regard to the question of how deficiencies were handled, Procedure No. 3 indicates in paragraph 3.1.4.5 that deficiencies could be either corrected immediately, or transferred to the contractor's QA/QC program (e.g., a contractor nonconformance report could be written), or documented on a YAEC Deficiency Report (the handling and disposition of which are also discussed in Procedure No. 3).

Attached to this response is an inspection report (IR) excerpt documenting the conduct of an NRC surveillance program inspection in the September-October 1983 time frame. Procedure No. 3 was included in the NRC review of surveillance program requirements, as were samples of surveillance and deficiency reports. An additional procedure (No. 4) referenced in this NRC inspection report excerpt, pertaining to the Field QA Checklists used in the conduct of surveillances, was also sent to the NRC EDO office for delivery to Dr. Myers.

EXCERPT FROM RESPONSE TO DR. MYERS' REQUEST OF OCTOBER 17, 1990
(2 sheets)

Request 4:

(Provide) evidence of the purported 100% YAEC review; e.g. documents that enumerate by weld number the welds that were reviewed, the results of any such review, etc.

Note: Contrary to the statement that appears in NUREG-1425, Appendix 8, page 8, "practically all" surveillance reports did not identify the film being reviewed by weld number. Moreover, the surveillance reports provided in response to Seabrook Welds XXXVI do not provide evidence of a 100% radiograph review; instead, the surveillance reports increase confidence in our conclusion that the preponderance of evidence indicates that prior to late 1983, YAEC did not conduct a review 100% of radiographs following approval by Pullman-Higgins.

Response:

As has been documented several times in previous responses to Congressional staff requests, the documented evidence of the YAEC performance of a 100% review of the Pullman-Higgins radiographs for safety-related welds is provided by the YAEC reviewer signature/initials on the RIRs applicable to each radiographed weld. NRC inspection, to include follow-up of specific cases identified by the Congressional staff, has not identified any welds for which YAEC radiographic review was not conducted.

For radiographic weld quality, the objective evidence is available in the radiographs themselves; and documentation of the licensee's QA program review of the acceptability of those radiographs is provided in the Radiographic Inspection Reports (RIRs). The YAEC practice to sign/initial and date each RIR to signify review and acceptance of the Radiographic Inspection Report and the radiographs which it covered was both a convenient and consistent way of providing objective evidence that YAEC reviewers were performing their review function.

The Congressional staff indicates in the above request that the surveillance reports do not provide evidence of a 100% radiographic review. We agree with this assessment, but would add that it was never the intention of YAEC to document on surveillance reports each and every radiographic film package reviewed. The use of surveillance reports as such would have been redundant to the YAEC practice of signing each RIR, a practice which commenced in 1979 when the first set of radiographic film packages were turned over by Pullman-Higgins.

Furthermore, the Congressional staff statement in the above request that "prior to late 1983, YAEC did not conduct a review 100% of radiographs following approval by Pullman-Higgins" confused the understanding of what actually did occur. It may be true that YAEC did not conduct a review of radiographs immediately following approval by Pullman-Higgins. As has been stated previously in response to Congressional staff requests, YAEC reviewed the film after Pullman-Higgins turned it over for review. Whenever that turnover occurred, relative to when Pullman-Higgins completed their review, was dependent upon Pullman-Higgins initiative to provide the accepted radiographs to YAEC for their review.

(Request 4 Continued)

YAEC film reviewer involvement in the transmittal process of Pullman-Higgins radiographs to the Records Vault and acceptance of the film for owner storage encompassed a technical review function, rather than an accountability exercise. This is why YAEC instituted in 1985 a re-inventory and indexing program for all film already stored in the Records Vault to confirm that the radiographs had been correctly accounted for, stored and labeled. During their re-inventory, YAEC reviewers checked that receipt of the film transmittal packages had resulted in evidence of proper review and indexing. Where deemed necessary, individual radiographs and the applicable RIRs were examined. It was during their re-inventory and indexing program that the problems identified in Deficiency Notice (DN) 090 were identified, as is noted in the discussion provided in Congressional staff Request 5.

Furthermore, when the YAEC QEG NDE Review Group Procedure No. 5 was issued in 1984 "to perform review of all safety-related vendor and site generated radiographs," this requirement imposed a 100% review activity independent of time. Since the radiographs already accepted by YAEC prior to May 1984 were available in the Records Vault, YAEC would have been required to initiate a retrofit effort to review all stored film if they had not been doing so as a routine activity during the turnover process. As confirmed in discussions with YAEC personnel, such a major retrofit activity was unnecessary because the 100 percent film review was considered a normal surveillance activity, routinely conducted over time. Issuance of this procedure also meant that any film that had not been previously reviewed and accepted by YAEC (regardless of when the radiographs were shot or when they were accepted by Pullman-Higgins or whether they were backlogged film or even whether they might have mistakenly made it to the vault and were subsequently discovered during the re-inventory in 1985) was now procedurally required to be reviewed. During the conduct of the NRC Construction Appraisal Team (CAT) inspection in 1984, when over 3,400 pieces of radiographic film from the Record Vault were reviewed, no problems were identified with the radiographs from the 180 Pullman-Higgins pipe welds which were examined. This is most likely because the Pullman-Higgins film stored in the vault had been subject to the YAEC review program and as documented in CAT inspection report (i.e., 50-443/84-07), "no deficiencies were identified with the radiographs that had received the applicant's review."

In summary, YAEC imposed upon themselves a procedural requirement to perform a 100% review of all safety-related, Pullman-Higgins radiographs. This requirement was not time dependent relative to its applicability. Therefore, all RIRs, including those dating back to 1979, were procedurally required, with the implementation of the YAEC QEG NDE Review Group Procedure No. 5, to show evidence of YAEC review for acceptability. This evidence is provided by the YAEC reviewer signature/initials on the RIR. Finally, as has been previously stated, NRC inspection, including that of the Independent Review Team, has not identified any weld for which the YAEC required 100% radiographic review was not conducted.

Note: See discussion in response to Request No. 8 regarding identification of weld numbers on surveillance reports.

MEMORANDUM FOR: T. E. Murley, Regional Administrator, Region I
FROM: R. W. Starostecki, Director, Division of Project and
Resident Programs
SUBJECT: NRC FOLLOW-UP - SEABROOK NDE FALSIFICATION

On May 4, 1983 Region I was notified, by Public Service Company of New Hampshire, in accordance with 10 CFR 50.55(e), of the questionable performance of material and weld surface nondestructive examinations (NDE) by one contractor technician. Prior to any determination of falsification, the licensee's internal investigation revealed that NDE procedures had been violated. This information was sufficient to cause the contractor to terminate the subject technician and place on hold all 2,399 nondestructive examinations performed by the individual, until re-examination and disposition could be performed. It is noted that although only 33% of the suspect NDE work was performed on safety-related welds, the licensee decided to evaluate all 2,399 cases. As a result of this incident in May, I personally contacted the Executive Vice President of PSNH, Mr. David Merrill, and emphasized to him the need for a thorough and complete reassessment of all work done by the falsifier. PSNH acknowledged that they had already taken steps in this matter. Additional meetings were also held with both PSNH and YAEC to discuss the performance in general of the subject contractor.

As part of our effort we have been reviewing a number of licensee-initiated reports as well as conducting independent inspections. Upon completion of the OI effort we were able to conclude that there was no management complicity. However, IE staff expressed their interest by telephone and my staff has kept them fully informed and advised.

By memo dated December 21, 1983 IE requested certain actions relative to the Seabrook NDE falsification issue. Our prior actions appear to have adequately anticipated the IE concerns since we also had the same concerns last May. However, it is disheartening to note that telephone discussions on this very topic were not sufficient and resources had to be diverted to prepare additional documentation several months after we have conducted meetings with the licensee and on-site inspections on the topic. In an environment where resources are extremely strained and where the subject plant is in the midst of a volatile public hearing, I question the motivation to divert inspection resources to prepare more 'paper' in light of the fact that the information is already available and documented. More recent inspection effort will be documented shortly.

Review, by resident and regional inspectors, independently, of the audit program, in existence at the time of the incident indicated that the program was being conducted in accordance with NRC requirements and FSAR commitments. The contractor NDE staff organizationally reports to the contractor Field QA Manager. Contractor QA auditors, located on-site, and licensee (thru their agent - Yankee Atomic Electric Company, YAEC) auditors conduct periodic audits

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of the contractor NDE program. A key operation in providing assurance of QC field activities is the YAEC surveillance program. Specifically, YAEC NDE personnel had been and still do conduct 100% review of contractor accepted radiographs. Also, YAEC QA inspectors conduct both random and scheduled surveillances of field NDE work. An example of this activity is appended to the subject investigation report, in that a YAEC surveillance report documents an earlier identified violation of the conduct of a liquid penetrant examination by the offending NDE technician. In this case, the work was nonsafety-related and corrective action consisted of re-conduct of the examination and verification that the technician was knowledgeable of the procedural requirements. It should also be noted that the original NDE falsification problem was identified by the contractor when another NDE technician identified a concern with the offending technician's acceptance of a weld. Followup of that concern through the contractor's program led to the 10 CFR 50.55(e) report.

The re-examination of previously accepted work is not considered to be required for an effective audit program. Yet in this case, which involved random and periodic falsification, it appears that a re-examination program may have been the only quantitative method to establish the existence of a problem. As one of the corrective actions, the licensee has instituted a sample NDE re-examination program. Although this action is beyond any regulatory requirement and beyond the norm of NDE activities observed in the nuclear construction industry the licensee did institute this effort and we strongly encouraged the initiative at senior management levels.

Subsequent to the identification of the NDE falsification, the licensee committed to the following actions relative to oversight of NDE activities. These commitments are documented in Inspection Report 50-443, 444/83-06, and were discussed during a June 7, 1983 meeting.

- A sample re-inspection of other contractor NDE technician work with results confirming that the problem was restricted to the one individual.
- Increased contractor supervisory field checks and independent auditing.
- Increased licensee surveillance of NDE activities on all shifts.
- Establishment of a licensee program for "information only" NDE to be performed by an independent contractor to verify that ongoing NDE work has been and is being satisfactorily performed and correctly evaluated.

While the current NDE audit program may be more prescriptive and better directed to the identification of NDE problems, we do consider the former NDE audit program to have been consistent with existing QA guidance and to have been effectively implemented by the licensee.

EXCERPT FROM RESPONSE TO DR. MYERS' REQUEST OF JUNE 19, 1990 (3 sheets)

Request 2 (questions 1, 2 & 3 of June 19, 1990):

1. (paraphrased) In my May 29 memorandum I requested that I be provided the procedures that, prior to implementation of Procedure #5 in May 1984, governed the YAEC 100% radiograph review. The May 29 request encompassed procedures that mandated the review.

Whether or not a specific procedure governed the YAEC 100% review prior to May 1984, I assume the ongoing NRC inspection will provide information: (Several questions follow)

Response

Response to questions 1a through 1f and 2 have been provided separately.

Questions 1g & 3

- 1g. A statement as to the approximate date on which the NRC learned of the YAEC 100% review and a discussion as to whether and during what time period the NRC assessed the adequacy of this review.
3. As of this date, I am unable to locate an NRC document, issued prior to IR 90-80 on February 7, 1990, which refers to a YAEC 100% review. If the NRC staff knows of any such reference, please provide it to me prior to COB, Friday, June 22.

Response

NRC Region I was aware in December 1983 of the licensee's intent to review 100% of the radiographs transmitted to the document control vault as quality records. This date is based upon documentation in a January 4, 1984 Region I memorandum (previously provided) documenting NRC awareness of the YAEC 100% radiographic review and upon reference in the resident inspector SALP office files to Deficiency Report (DK) 527 issued on December 7, 1983 with the supporting "YAEC RT INTERPRETATION" listing. It is possible that the NRC knew before December 1983 that YAEC was reviewing all film as it was received. However, we have not found any record of NRC cognizance of the 100% review prior to December 1983.

An NRC assessment of the adequacy of the YAEC review program was performed during the Systematic Assessment of Licensee Performance (SALP) conducted for piping systems and supports on February 14, 1984. This is documented in the final SALP report issued on May 17, 1984 as a YAEC "customer review" of ASME final code accepted radiographic film. Furthermore, the NRC Construction Appraisal Team (CAT) inspection conducted over the period

April 23 - May 25, 1984 reviewed several radiographic film packages. The CAT inspection report, 50-443/84-07, issued on July 18, 1984 documents the following:

"No significant problems were identified involving film that was reviewed by the applicant's NDE organization. However, several irregularities were identified involving film that had not [yet] been reviewed by the applicant."

If the film in which the irregularities were identified by the CAT inspectors had been accepted final radiographs, enforcement actions would have been pursued. Instead, the CAT recognized that the licensee's program required the noted YAEC review of all safety-related vendor and site generated radiographs. In documenting the difference between the radiographic film which had been reviewed by the applicant and that which had not, the CAT inspectors specifically highlighted the fact that the radiographic review process would have represented a regulatory concern had it not been for the applicant's review process. Hence, this area of inspection was not listed as one where either potential enforcement actions or significant weaknesses were identified. Such inspection logic and the resulting findings and conclusions represent an additional NRC assessment of the adequacy of the YAEC 100% radiographic review program.

Additional documentation of an NRC assessment of the YAEC radiographic review process can be found in other NRC inspection reports (IRs). As an example, IR 50-443/83-19 for inspection conducted from November 28 - December 1, 1983 included a review of the reactor pressure vessel (RPV) safe end radiographs. The NRC inspector reviewed radiographs that had been rejected by YAEC despite a differing position tendered by Westinghouse as the RPV supplier, and the NRC concurred with the YAEC findings. Other component radiographs were also reviewed, resulting in additional assessment of the quality of the YAEC review. An example is IR 50-443/85-31 for an inspection conducted from October - December 1985. Documented in this IR is the statement that:

"To date, the licensee has performed an overview of virtually all vendor supplied radiographic film. Where problems were found, such as geometric unsharpness failing to meet the ASME code, radiography was re-performed on site and repairs were made, if necessary."

The inspector reviewed a sample of film during this inspection, which also provided a measure of the NRC assessment of the YAEC radiographic review program.

Other NRC inspections (e.g., IR 50-443/85-19 conducted in July 1985) used the NRC NDE Van to independently radiograph welds. Such inspections verified the adequacy of the licensee's radiographic program and compared site file film to NRC radiographs in an assessment of the licensee's overall NDE quality control program.

Another assessment of licensee performance in this area was conducted during the SALP appraisal on February 19, 1985. In the SALP report, issued on May 28, 1985, the following evaluation was documented:

"It is noted, however, that with regard to completed and finally inspected hardware, very few problems were identified. In fact, in the welding and NDE areas, independent examinations by NRC inspectors revealed generally high quality work and effective licensee overview of the final radiographic film packages."

In assessing the overall performance in the area of piping during this January 1 - December 31, 1984 SALP period, it was noted that significant improvement had been achieved and that the licensee had demonstrated "adequate control over their self-identified construction problems." One of the areas evidencing such licensee control was the YAEC 100% radiographic review process.

Further, in the previously mentioned Region I internal memorandum of January 4, 1984, it was noted that:

"A key operation in providing assurance of QC field activities is the YAEC surveillance program. Specifically, YAEC NDE personnel had been and still do conduct 100% review of contractor accepted radiographs."

This memorandum not only provides the requested reference to an NRC document acknowledging the YAEC 100% radiographic review effort, but also assesses this program in the context of NRC followup of the previously reported NDE falsification problem, (i.e., the "Padovano" case). It should be noted that the above quote discusses the 100% review in reference to the "YAEC surveillance program." As has been discussed in previous responses to Dr. Myers' requests, prior to the implementation of the YAEC NDE Review Group procedure No. 5 in May 1984, the YAEC radiographic review process was controlled as a surveillance activity. Thus, even though surveillances were not normally 100% inspection efforts, the above NRC quotation illustrates the YAEC intent to conduct such film reviews on a 100% basis some time before the existence of the procedural requirement to do so.

The inspection reports identified in the response to this request have been provided previously.

EXCERPT FROM THE SEPTEMBER 21, 1990 RESPONSE TO THE AUGUST 9, 1990 LETTER FROM THE FIVE CONGRESSMEN (2 sheets)

Question III:

With respect to the 100% film review performed by the Seabrook licensee's agent, the Yankee Atomic Electric Company (YAEC), the NRC staff has provided inconsistent descriptions of the review's duration, nature and regulatory significance. Attached to this letter is a listing of characterizations of this review.

Since the NRC has relied upon the existence of the 100% YAEC review for assurance of weld quality, please provide a coherent and comprehensive description of the YAEC review's purpose and duration, documents subject to this review, review procedures, record keeping requirements, and procedures for handling deficiencies.

Response:

III.A Assurance of Weld Quality

The NRC staff did not rely solely upon the 100% YAEC review of radiographs for assurance of weld quality. Other processes were also used to control and ensure weld quality. For example, 10 CFR 50.55a prescribes compliance with the ASME Boiler and Pressure Vessel Code, Section III, for nuclear power plant component (including pipe weld) design, fabrication, construction, testing, and inspection. A specific example of the associated design margins and construction conservatism applied to the erection of ASME piping systems is that the installed piping is subjected to a system hydrostatic test of not less than 125% of the design pressure. This testing requirement is applied to all of ASME piping, including Class 3 systems, the welding of which does not even require radiography.

Additionally, 10 CFR 50, Appendix B, Criterion IX, requires that measures be established to ensure that welding, heat treating, and nondestructive testing are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, specifications, and criteria. This generic requirement applies to a series of welding procedures and controls for qualifying each welding procedure, testing each welder, controlling the welding material and welding process variables; specifying the sequence of welding, heat treating, and NDE operations; and implementing a system of in-process checks, weld inspections, and nondestructive examinations that are designed to confirm overall weld quality.

NRC inspections and assessments were conducted as independent checks of the effectiveness of the licensee's program of piping installation controls. NRC involvement in the inspection of pipe welding and NDE activities at Seabrook Station is documented in publicly available

NRC inspection reports dating back to 1978. Certain of these inspections resulted in NRC enforcement actions, and licensee corrective actions in response to several of the violations involved significant programmatic changes. An example was the response to NRC Immediate Action Letter IAL 80-55 issued in December 1980 relative to NRC-identified pipe repair welding problems. A dual repair process sheet system, providing more control of the repair welding process along with the establishment of additional verification hold points, was instituted after a temporary "stop-work" action was taken by the licensee for pipe repair welding. Another example was the corrective action on the NDE violations issued in 1982 in conjunction with Inspection Report 50-443/82-06. In this case, the contractor initiated a secondary review of radiographs prior to turnover to the YAEC (Yankee Atomic Electric Company). These examples reflect licensee program changes to correct NRC-identified problems and directly impacted the welding records, repair welding, and NDE activities which have been the specific subject of Congressional questions.

In the areas of piping, welding, and NDE, the NRC conducted over 70 separate inspections prior to the issuance of a fuel load license. Several of these were conducted by resident inspectors monitoring field activities over an extended period and were supported by specialist inspections, as necessary. The NRC Mobile NDE Van was used on three separate inspections at Seabrook Station to conduct independent measurements and examinations of piping material, components, and welds. Independent radiography was an integral part of the Van inspections. A fourth inspection, by NRC technicians using NDE Van equipment, was performed to verify the adequacy of a licensee weld surface re-examination program. Over 200 completed welds were independently inspected by NRC personnel utilizing NDE Van equipment. One of these was a reactor coolant system weld specifically highlighted as a concern of Congress in an April 2, 1990 letter to the NRC from six Members, including all of the Members who signed the August 9, 1990 letter to the NRC. This weld was the subject of independent NRC radiography and inspection evaluation with no adverse findings. Additionally, several hundred other piping welds were the object of NRC examination of in-process or completed welding or NDE activities during routine resident and region-based inspections at Seabrook Station.

In addition to NDE Van and routine inspections, NRC inspections have included independent review of licensee radiographs to verify weld quality. During one such inspection by an NRC Construction Appraisal Team (CAT), over 3,400 pieces of radiographic film were reviewed. In total, these NRC radiograph review inspections, along with the NRC routine welding examination and independent NDE Van inspection efforts which were conducted prior to the issuance of the fuel load license in 1986, established NRC confidence in the quality of Seabrook welds and overall adequacy of pipe erection. Therefore, while the YAEC radiographic review program was an important part of the integrated system which provided assurance of pipe weld quality, it was clearly not the only aspect relied upon by the NRC to assure weld adequacy.



CHAIRMAN

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

September 21, 1990

The Honorable Peter H. Kostmayer
Chairman, Subcommittee on General
Oversight and Investigations
Committee on Interior and Insular Affairs
United States House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

I am responding to the letter of July 30, 1990, in which you and Chairman Dingell raised several concerns regarding weld issues at the Seabrook Nuclear Power Station. Specifically, you identified three matters concerning the staff's independent assessment which you believe merit special attention and several facts which you believe cast doubt as to the licensee's ability to manage the project and the adequacy of the Nuclear Regulatory Commission's (NRC's) oversight of it.

On August 16, 1990, the NRC Independent Review Team Report, "Welding and Nondestructive Examination Issues at Seabrook Nuclear Station," was published as NUREG-1425. A copy of that report is enclosed. As discussed in the Executive Summary of NUREG-1425, the team's conclusion as to weld quality at Seabrook was based on (1) interviews and discussions with former Pullman-Higgins (P-H) employees, including Mr. Wampler, and current Yankee Atomic Electric Company (YAEC) and New Hampshire Yankee (NHY) employees who were involved with, or knowledgeable of, the P-H pipe welding and Non-Destructive Examination (NDE) processes as well as the quality assurance efforts which were applied to these activities; (2) evaluation of records and radiographs associated with the fabrication and NDE of 145 pipe welds from different plant systems, pipe sizes, and fabrication codes and periods; (3) evaluation of records involving identification, evaluation and disposition (including reporting to NRC) of about 300 nonconforming conditions which had occurred during fabrication and NDE of pipe welds; (4) evaluation of the training, qualification and certification records of 24 NDE personnel who had reviewed and accepted final pipe weld radiographs; (5) evaluation of procedures used for P-H welding and NDE activities and for the quality assurance efforts which were applied to these activities; (6) evaluation of records associated with about 200 quality assurance surveillances and audits of P-H pipe welding and NDE activities; (7) evaluation of records associated with employee

[Identical ltr to Rep. John D. Dingell

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concerns program investigations of 34 concerns about P-H pipe welding and NDE activities; and (8) visual inspection of pipe welds when deemed appropriate. On the basis of this broadly based review, the team concluded that the pipe welding and NDE programs were generally consistent with applicable codes and NRC requirements and resulted in technically acceptable pipe welds at Seabrook. This conclusion confirmed the NRC staff conclusion prior to licensing that Seabrook welds were adequate.

With respect to the criteria used for the selection of the 145 welds and the team's review of them, we believe that sufficient detail is provided in Sections 8, 9, 10, 11, 12 and 13 and in Appendices 2, 3, 5, 6 and 7 of the team's report. The welds selected provided a range of differences in such variables as code classes, carbon and stainless steel material, pipe diameters and thicknesses, construction time periods, various level II and III film interpreters, and potential problem welds (e.g., dissimilar metal welds and welds from systems denoted by Mr. Wampler as problem areas during his interview with the team). The sample was selected through review of the Pullman-Higgins Weld Repair Log, Mr. Wampler's logbook, Congressional correspondence, Region I inspection reports, piping isometric drawings, and various documents that identified nonconforming conditions.

Radiograph authenticity was addressed during NRC construction inspections, including Non-Destructive Examination Van inspections which specifically compared licensee radiographs with independent NRC radiography, and no problems were identified. Weld radiograph authenticity was also determined by the NRC Independent Review Team; this matter was discussed during meetings with Congressional Committee staff, and is documented in Appendix 5 of the team's report.

Regarding your concern about discrepancies in information provided to the IRT, we have not found significant differences between the information provided by Mr. Wampler and the information obtained by the NRC Independent Review Team during various interviews and discussions with former Pullman-Higgins employees, current Yankee Atomic Electric Company employees, and current New Hampshire Yankee employees. The team followed normal NRC interview practice on such inspections and did not transcribe interviews with the exception of Mr. Wampler's. Transcribing the interview with Mr. Wampler was his condition for meeting with the NRC. Notwithstanding the difference in interview documentation, the Independent Review Team asked appropriate questions during its interviews and discussions with all individuals contacted. The pertinent information is documented throughout the team's report

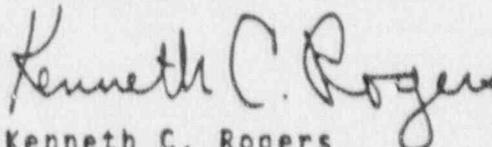
for all the individuals involved, including Mr. Wampler. Also, as described in Section 1 of the team's report, the team's findings were not based solely on interviews, but rather on a composite of various techniques to determine whether an issue had been adequately resolved.

In summary, the results of both the Independent Review Team inspection activities and the NRC staff reviews in response to Congressional staff questions have been confirmatory in nature. These efforts validated previous NRC assessments which were part of the basis for the licensing of Seabrook Station.

With respect to the NRC oversight and licensee management of the Seabrook welding project, the information provided in Enclosure 1 provides a summary of the NRC inspection and evaluation efforts at Seabrook and the licensee's response to these efforts. The NRC expended a significant amount of resources for inspection of the licensee's pipe welding and nondestructive examination (NDE) programs before the issuance of the fuel loading license in October 1986. This inspection effort began in 1978 and included in-process reviews, independent reviews of licensee radiographs, and independent NDE of certain licensee welds by the NRC NDE van. From 1980 to 1983, several violations of NRC requirements were identified and revisions to the licensee's welding and NDE process were initiated. While not timely, these corrective actions were thorough and eventually resulted in an improved program that established NRC confidence in the quality of welds and overall adequacy of pipe fabrication. The adequacy of the licensee's program was further confirmed by the NRC Independent Review Team evaluation made after the operating license was issued.

The Commission appreciates the opportunity your letter afforded to review and respond to your concerns in the context of the IRT independent assessment. I hope the information we have provided will be helpful to you and the members of your respective Subcommittees. Commissioner Remick did not participate in the preparation of this response.

Sincerely,



Kenneth C. Rogers
Acting Chairman

Enclosures:

1. NRC Inspection and Evaluation at Seabrook

NRC INSPECTION AND EVALUATION AT SEABROOK

Prior to the issuance of a full-power operating license for Seabrook Station on March 15, 1990, the NRC expended approximately 35,000 inspection-hours in the areas of design, construction, testing and low-power operation of Unit 1. This effort was predominantly field inspection to ensure conformance to the design and compliance with committed standards and regulatory requirements.

NRC involvement in the inspection of pipe welding and NDE activities at Seabrook Station began in 1978 and is documented in publicly available NRC inspection reports. Prior to issuance of the fuel loading license in October 1986, the NRC conducted over 70 inspections of the piping, welding, and non-destructive examination (NDE) process at the Seabrook Station. These inspections included four independent evaluations of 200 welds using NRC NDE equipment, a Construction Appraisal Team (CAT) Inspection in which 3,400 licensee radiographs were independently reviewed, and continuing reviews of the construction process (including welding and NDE) by NRC resident and Region-based inspectors.

A review of the inspection results indicates that the NRC staff identified problems during the construction process and initiated actions to increase licensee attention to the deficient areas. These actions included issuance of 28 notices of violations over the eight year period, with 23 issued during the period from 1980 to 1983. In response to these violations, the licensee revised its program for assuring welding and NDE quality. An example was the licensee's response to Immediate Action Letter (IAL) 80-55, issued on December 22, 1980, with respect to NRC-identified pipe repair welding problems. A dual repair process sheet system providing more control of the repair welding process, along with the establishment of additional verification hold points and increased Yankee Atomic Electric Company (YAEC) surveillance of welding activities, was instituted after a temporary "stop work" action was imposed for inadequate pipe repair welding. Another example was the secondary review of radiographs prior to turnover to the YAEC that was initiated by the licensee's contractor in response to the NDE violation identified in Inspection Report 50-443/82-06. These examples reflect licensee program changes to correct NRC-identified problems and to improve the quality of welding records, repair welding, and NDE activities at the site.

Also, from 1980 to 1987, the NRC conducted eight separate Systematic Assessments of Licensee Performance (SALPs) which evaluated construction activities, including one SALP in 1983 devoted entirely to piping systems and supports. During the period from 1980 to 1983,

the NRC issued a "Below Average" and three SALP Category 3 ratings for the piping systems and support area. At the time, a Category 3 SALP rating was defined as "Both NRC and licensee attention should be increased. Licensee management attention or involvement is acceptable and considers nuclear safety, but weaknesses are evident; licensee resources appear strained or not effectively used so that minimally satisfactory performance with respect to operational safety or construction is being achieved". This evaluation is the lowest category given to a plant but does not declare the area unsatisfactory, which would indicate a complete programmatic breakdown in the control of quality. This increased inspection, enforcement action, and SALP attention to the area of piping, welding, and NDE resulted in continued YAEC Quality Assurance (QA) oversight of the contractor.

Concurrent with the start of radiographic examinations of piping in 1979, YAEC began a Surveillance Program review of all contractor weld film with the intent to reduce the scope of the review when confidence in the contractor's ability to identify and correct deficiencies was obtained. The 100 percent review was never reduced because of deficiencies identified by YAEC and the NRC. This 100 percent review process was highlighted in an NRC internal memorandum during the latter part of 1983, when a significant number of film problems were being identified by YAEC QA or deficiency reports. While the NRC agrees that the contractor's response to these deficiencies could have been more timely, no significant breakdown in the QA program for welding and NDE occurred because the YAEC Surveillance Programs had identified the deficiencies and had initiated corrective actions.

The licensee's performance improved and was noted in subsequent inspection results and SALP evaluations. Inspection reports noted a steady improvement in performance with only two violations issued in ten inspections during 1984, two violations in 11 inspections in 1985, and no violations in five inspections during 1986. In assessing the overall performance in the area of piping during the 1984 SALP period, it was noted that significant improvement had been achieved and that the licensee had demonstrated adequate control over its self-identified construction problems. The SALP evaluation also concluded "that with regard to completed and finally inspected hardware, very few problems were identified. In fact, in the welding and NDE areas, independent examinations by NRC inspectors revealed generally high quality work and effective licensee overview of the final radiographic film packages." In the SALP periods just prior to and during the issuance of the fuel loading license, the functional area incorporating the welding and NDE activities was evaluated as SALP Category 1, the highest rating.

With respect to Mr. Wampler, his initial contact with the NRC in early 1984 did not involve concerns about weld and NDE quality, but rather issues related to his termination for raising occupational radiation safety allegations that were referred to and addressed by the State of New Hampshire (Agreement State) and the U.S. Department of Labor (DOL). Mr. Wampler also stated that he had approximately 16 nonconformance reports to write on welds at the time of his termination and did not know how these deficiencies would be handled. In a followup telephone conversation on February 3, 1984, the NRC Senior Resident Inspector indicated to Mr. Wampler that the radiographic film problems were being tracked by deficiency reports and asked him if he had any knowledge of problems or wrongdoing by the licensee in this regard. Mr. Wampler said, "No." Portions of the DOL hearing transcript which highlighted testimony by Mr. Wampler on the weld and radiographic reject problems were also reviewed by the Senior Resident Inspector in January 1986. This review did not identify any allegations related to construction quality or any new technical information which warranted further follow-up. As documented in Inspection Report 50-433/83-22, the NRC reviewed the available in-process records and the coordination being effected to transfer Mr. Wampler's function, records, and open items after his departure. The NRC inspector concluded that concerns raised by Mr. Wampler would be adequately addressed. This conclusion was later affirmed by NRC inspections in 1990 in response to congressional inquires.

After issuance of the Seabrook Station Full Power Operating License, the NRC assigned an Independent Review Team (IRT) to make an after-the-fact assessment of Seabrook welds in order to address congressional concerns. The IRT focused on the quality of the finished hardware and associated records as well as the adequacy of the overall quality assurance program as applied to the fabrication and NDE programs for pipe welds. Within the broad scope of the IRT's review, it was noted that four unacceptable hardware conditions (weld defects) had been identified by the licensee later than would normally have been expected. This is discussed in Section 17 of the IRT report. These had been missed by the various licensee inspection programs. The deficiencies were found via other mechanisms, were identified by the licensee as nonconforming conditions (NCRs), and were evaluated and corrected. The IRT also identified another unacceptable hardware condition (weld defect) during its review of pipe weld radiographs, as discussed in Section 8 of the IRT's report, that likewise had been missed. In this case, the code-rejectable linear indication was faint and only 1/8 inch longer than the code acceptance criteria (1/4 inch) for the specific weld thickness. This made the indication easy to overlook. Subsequently, the licensee determined that the weld in its present condition was acceptable for its design service conditions, and the

IRT agreed. On the basis of the team's evaluation, the code-rejectable-type indications were minor and would not have impaired the safety of the plant. The IRT concluded that the pipe welding and NDE programs were generally consistent with applicable codes and NRC requirements and resulted in technically acceptable pipe welds at Seabrook Station. The results of the IRT were published on August 6, 1990, in NUREG 1425, "Welding and Nondestructive Examination Issues at Seabrook Nuclear Station."

EXCERPT FROM THE SEPTEMBER 21, 1990 RESPONSE TO THE AUGUST 9, 1990 LETTER FROM THE FIVE CONGRESSMEN (2 Sheets)

III.B Consistency of NRC Statements

Question III and its reference to attached NRC quotations question the consistency of NRC statements on the YAEC film review process. Several requests from Congressional staff members on these matters have involved questions of how the Pullman-Higgins radiographs were handled.

As we have previously described to the Congressional staff, the YAEC radiograph review program also encompassed the examination of film supplied by vendors and site contractors other than Pullman-Higgins. The radiographs for vendor-supplied component welds (e.g., Dravo pipe shop welds, manufacturer seam welds for equipment, etc.) were received on site in conjunction with the component delivery to the site. These radiographs were placed in vault storage for control and preservation prior to review by YAEC film reviewers. This process was different from the one for handling Pullman-Higgins (P-H) radiographs in that P-H film was reviewed as it was turned over to YAEC and placed in the vault only if accepted by the YAEC review.

The NRC CAT inspection (50-443/84-07) in 1984 appraised the entire welding and NDE program being implemented for the construction of Seabrook Station, not just that of Pullman-Higgins. Thus, the selected quotations from the CAT inspection report which were highlighted in the Congressional letter attachment reflect the difference between the film already reviewed by YAEC (e.g., Pullman-Higgins) and the film not yet so reviewed (e.g., vendor film), and do not contradict other NRC documentation and information provided to Congressional staff members.

A March 15, 1990 letter from NRC Chairman Carr provided an NRC staff response to a question in this regard raised by Congressman Kostmayer on March 7, 1990. The following is an excerpt from that response:

If the film in which the irregularities were identified by the CAT inspectors had been finally accepted radiographs, enforcement actions would have been pursued. Instead, the CAT inspectors recognized that the licensee's program required the noted YAEC review of all safety related vendor and site generated radiographs.

A similar explanation applies to item 12 of the Attachment to the Congressional letter of August 9, 1990. What is highlighted in this item is a previous NRC staff response to Congressional staff questions on this matter which discusses "the licensee's intent to review 100% of the radiographs transmitted to the document control vault as quality records." The term "intent" was used in the NRC staff response because, as of December 1983, notwithstanding the fact that a YAEC 100% review of contractor radiographs was being conducted, there existed no regulatory, code, or procedural requirement for this 100% review to continue. As discussed in the response to Question I, the licensee could have reduced the level of

their review below 100% anytime prior to May 1984, when the 100% scope of this surveillance activity was incorporated in a procedure. Had that occurred, NRC inspection would have evaluated the effectiveness of such a decision. In fact, the NRC CAT inspection in April and May 1984 observed the need for and value of continued application of a rigorous licensee film review program. It was in this context that the inspection findings and conclusions of the NRC CAT inspection were documented in IR 50-443/84-07 and were discussed and explained in the March 15, 1990 NRC response to Congressman Kostmayer's questions.

It is noteworthy that the 1984 NRC CAT documented the fact that "no deficiencies were identified with the radiographs that had received the applicant's review." No deficiencies were identified by the CAT in radiographs supplied by Pullman-Higgins because all of the Pullman-Higgins radiographs stored in the vault had already been appropriately reviewed and accepted by YAEC reviewers.

The NRC staff does not believe there are contradictions in the NRC statements quoted in the Attachment to the Congressional letter of August 9, 1990, forwarding this current set of questions. Concerns expressed in this regard appear to relate more to phrase interpretations and the evolution of NRC inspection documentation than to substantive conflicts in the NRC understanding of what transpired in that historical time frame. As a case in point, although it was not quoted in the current set of Congressional questions, a response to a Congressional staff member's request of May 29, 1990, regarding the YAEC 100% radiograph program is provided as an attachment (Attachment 1). This document illustrates consistency in the NRC understanding, responses, and NUREG-1425 documentation of this issue.

The NRC staff believes that a coherent and comprehensive description of the YAEC radiograph review program is documented in NUREG-1425. That report is consistent with the responses provided by the NRC staff to over 30 sets of questions on this subject from Congressional staff members and documents the findings of an inspection by the NRC Independent Review Team. That team inspection focused on the quality of the finished hardware and associated records as well as on the adequacy of the overall quality assurance program applied to the fabrication and NDE programs for pipe welds.

EXCERPT FROM THE RESPONSE TO DR. MYERS' AUGUST 6, 1990 REQUEST (2 sheets)

Request 2 (August 6, 1990): (excerpted)

What does it mean when welds for which YAEC acceptances are indicated by signatures on the RIR's are subsequently listed on a YAEC Deficiency Report? In this case (YAEC DR 527), the same person signed both the DR and RIR.

Response:

It means that the individual discrepancy associated with any particular weld radiograph or Radiographic Inspection Report (RIR) was corrected by Pullman-Higgins and evaluated and accepted by YAEC prior to the issuance of the deficiency report (DR). Such was the case for the specific examples noted by Dr. Myers in his question with respect to DR 527. Dr. Myers' memorandum of August 6, 1990, in a preface to the question noted above, documents an NRC staff response to Request 3a & b of his "Seabrook Welds (XIII)" memorandum of May 29, 1990, as follows:

"As is discussed in the response to Request 1, the final acceptability of a radiograph and of the weld it represents was verified by YAEC reviewer signature or initials on the Radiographic Inspection Report (RIR) for safety-related welds. Thus the deficiencies identified in the subject deficiency reports (DRs) did not have to be correlated (in the DRs themselves) with the welds to which they applied, because an unacceptable radiograph would not have had its associated RIR signed off by YAEC."

The remainder of the above paragraph follows.

"Interviews with YAEC QA personnel involved in the NDE Review Group activities revealed that a decision was made not to correlate each deficiency with the affected weld so that YAEC could elicit generic corrective action from Pullman-Higgins rather than provide a detailed list of items to be corrected."

While these particular responses were written prior to the discovery by the NRC staff of the existence of a YAEC RT INTERPRETATION listing enumerating the weld discrepancies associated with DR 527, they remain valid. Interviews with cognizant YAEC QA personnel further revealed that the discrepancies categorized and tabulated on DR 527 had been identified over a period of time. Even though some of these discrepancies had already been corrected by Pullman-Higgins before DR 527 was issued, the general nature of such discrepancies was still characterized by the different categories of deficiencies on the DR. This was done, as was documented above, "so that YAEC could elicit generic corrective action from Pullman-Higgins."

As documented in the NRC staff response to previous requests from Dr. Myers and further discussed in NUREG-1425 (e.g., p. 3-4), controlled speedletters (CSLs) were sometimes used to direct Pullman-Higgins to take corrective action on radiographic deficiencies, particularly film defects. Paperwork and editorial discrepancies associated with the RIRs provided additional examples of the types

of problems handled without the issuance of a DR or deviation notice (DN). Regardless of the means utilized by YAEC to initiate the required corrective action by Pullman-Higgins, the final acceptability of a radiograph and of its associated Radiographic Inspection Report was verified by the YAEC reviewer signature or initials on the RIR.

Thus, the YAEC sign-off dates for the welds listed by Dr. Myers in the preface to the above question represent the dates when the corrective action taken by Pullman-Higgins was accepted by YAEC review. An examination of the RIRs for four of these five welds reveals the discrepancy noted on the YAEC RT INTERPRETATION list for each weld was, in fact, corrected prior to YAEC reviewer signatory acceptance. In the case of the fifth weld (i.e., RC-12, F0102), no discrepancy was noted on the YAEC RT INTERPRETATION listing. It appears that the Congressional staff may have confused an informational radiograph taken on a shop weld on the RC-12-01 pipe line with field weld RC-12, F0102, which the YAEC RT INTERPRETATION list indicates was accepted by YAEC without need for correction by Pullman-Higgins.

In summary, four of the welds raised as examples in this question represent cases where the RIRs were indeed signed off by YAEC prior to the issuance of DR 527. In each case, the corrective action was completed prior to YAEC acceptance of the radiographic package and sign-off of the RIR. The tabulation and consideration of these particular deficiencies (even though they had already been corrected) in the DR 527 discrepancy categories was acceptable because, as stated above, generic corrective action was expected of Pullman-Higgins.

EXCERPT FROM RESPONSE TO DR. MYERS' OCTOBER 17, 1990 REQUEST (2 sheets)

Request 3:

(Provide) documents that specify conditions required to be met prior to placement of a YAEC signature on a Radiographic Inspection Report (RIR) and/or documents that describe precisely what was being approved when the YAEC official affixed his signature to the RIR.

Response:

No specific procedure or documented requirement delineates the meaning or conditions attached to the placement of a YAEC signature on a RIR. However, the YAEC Quality Engineering Group (QEG) NDE Review Group Procedure No. 5 documents the following condition imposed upon the YAEC radiography review process.

"Methods and criteria used to review radiographs shall be the same as the originators."

Even though this procedure was not formally issued until May 1984, the YAEC signatures on the RIRs, both before and after procedural issuance, were intended to signify a YAEC review to the same criteria "as the originators" (i.e., Pullman-Higgins). This position was confirmed in discussions with YAEC personnel who had been involved in the film review process. Additionally, the NRC Independent Review Team evaluated the YAEC film review process and documented in NUREG-1425, Appendix 8, the observation that:

"Discussions with YAEC personnel involved in the review of film indicated that their reviews of final film always included a review for weld defects and film quality. The team's film review (see Section 8 of this report) supported this statement."

This conclusion is also logically corroborated by the fact that the YAEC reviewer's signature or initials, along with the date reviewed, appear at the bottom of the RIR form, near the signatures of the Pullman-Higgins reviewers (Level II and Level III) and that of the Authorized Nuclear Inspector (ANI for ASME welds. A YAEC official affixing his signature/initials to an RIR meant that he had reviewed both the RIR and the applicable radiographs to the same code criteria as the Pullman-Higgins personnel whose signatures were already documented.

This position is also substantiated by the evidence indicating that YAEC reviewers would not sign the RIRs if they identified problems during their review. This evidence not only is documented in numerous deficiency reports (DRs), several of which were issued prior to May 1984 when the YAEC QEG NDE Procedure No. 5 was formalized, but also was provided to Dr. Myers in response to a previous request (XXXII) of August 6, 1990. At that time, the NRC was requested to explain what it meant for a specific number of welds to be listed on DRs issued after the RIRs had been signed by YAEC reviewers. NRC inspection, review and response for all of the examples cited by Dr. Myers revealed that "in each case, the corrective action was completed prior to YAEC acceptance of the radiographic package and sign-off of the RIR."

(Request 3 Continued)

Therefore, although no documents clearly delineate either the conditions or what was being approved by the YAEC reviewer when he signed the RIR, the available evidence suggests that he was accepting the RIR as a quality document and accepting the disposition of the RIR as to the acceptability of the radiographic weld quality. As noted above, this position was confirmed by the NRC Independent Review Team, by NRC inspection follow-up of issues raised by the Congressional staff, and by discussions with licensee personnel directly involved in the YAEC radiograph review process.

EXCERPT FROM THE RESPONSE TO DR. MYERS' OCTOBER 17, 1990 REQUEST (2 sheets)

Request 6:

(Provide) an explanation of which items in Master Check List: ASME Section V, Revision 0 indicate that radiographs were reviewed for the purpose of identifying weld deficiencies. [For example, what is the basis for believing the Master Check List was to be used to determine whether proper procedures had been followed, as opposed to being used to determine whether the radiograph reviews had actually identified defects as required by the Code?]

Response:

The Master Checklist in question (i.e., ASME Section V, Revision 0) was used by the YAEC QA program personnel in the surveillance of radiography to check that the specific standards and criteria (i.e., the referenced T-numbers) delineated in Article 2, Radiographic Examination, of the ASME Boiler and Pressure Vessel Code, Section V, were being implemented by Pullman-Higgins NDE personnel. While ASME Section V, Article 2, does not prescribe criteria for the actual evaluation of defects, it does cover two areas (T-233.2, Quality of Radiographs and T-290, Evaluation of Radiographs) where radiographic interpretation is discussed. The Master Checklist in sections 1.6 and 1.7 detail evaluation points which reference the noted ASME Section V interpretation criteria, T-233.2, T-291 and T-292.

When the YAEC film reviewers were conducting RT surveillance activities, their use of Master Checklists in examining final film also involved a radiographic interpretation of that film. As an example related to the use of Master Checklist section 1.7, where the film area of interest was viewed for marks which would interfere with a proper radiographic interpretation, a YAEC review of the film for weld defects was implicit in the viewing of that film for any marks which might mask those defects. Also, the Master Checklist section 1.6 asks in effect whether an RIR evaluation of weld quality accompanies the radiographs being reviewed. Implicit in the YAEC film review personnel's answer to this checklist question is their assessment of the correctness of that RIR evaluation. Thus, the YAEC film reviewers were indeed reviewing and interpreting the radiographs in line with evaluating the procedural and other Section V, Article 2, criteria listed. If YAEC QA personnel, other than the film reviewers, conducted RT surveillance activities, their completion of the Master Checklist would not fulfill the requirements of the YAEC 100 percent radiograph review function. In that case, an additional YAEC film review was required to sign off the RIRs.

Discussions with YAEC personnel involved in the radiographic review process confirmed the position that when final film was being examined by the film reviewers during a YAEC surveillance activity, weld quality as well as film quality was reviewed. This point is also discussed in NUREG-1425 on page 8 of Appendix 8.

Furthermore, Master Checklists, other than "ASME Section V, Revision 0", were utilized in the YAEC QA program surveillances of the radiographic review process. For example, another Master Checklist (i.e., "RT-1, R-0") specifies in section 1.2 sign-off criteria to "verify radiographic film review" and

(Request 6 Continued)

dictates in section 1.3 the examination of the area of interest to include the question, "were all relevant indications addressed on RIR?" An additional Master Checklist (i.e., "248-5") used by YAEC personnel has within its surveillance criteria inspection items that also suggest a review of radiographs for defects is inherent in the conduct of the radiography surveillance activity.

Therefore, the NRC believes that the Master Checklists utilized in the YAEC surveillance of radiography activities were used both to verify procedural adherence, as well as to conduct an additional radiographic review of the film to confirm Code compliance. The basis for this position, as is questioned in the above request, is the NRC review of the various Master Checklists, discussions with some of the YAEC personnel involved with their use in the conduct of surveillances, and the fact that several of the surveillance reports themselves (i.e., the QA record to which the Master Checklists are attached) clearly identify that YAEC reviews of radiographs for weld quality were conducted.