September 20, 1991

MEMORANDUM FOR: James H. Joyner, Chief, EPRPB, DRSS, Region I
Douglas M. Collins, Chief, EPRPB, DRSS, Region II
L. Robert Greger, Chief, RPB, DRSS, Region III
A. Bill Beach, Director, DRSS, Region IV
Gregory P. Yuhas, Chief, EPRPB, DRSS, Region V

FROM: LeMoine J. Cunningham, Chief
Radiation Protection Branch
Division of Radiation Protection
and Emergency Preparedness
Office of Nuclear Reactor Regulation

SUBJECT: HEALTH PHYSICS POSITION: TASK QUALIFICATION OF HP TECHNICIANS

A Health Physics Position on the task qualification of HP technicians is enclosed for your information.

The position is essentially the same as the draft position sent you on August 27, 1991 for your review. This position has been coordinated with the Human Factors Assessment Branch.

This memorandum and enclosure are being placed in the NRC Public Document Room. Therefore, copies can be provided to licensees.

Original signed by Thomas H. Essig
LeMoine J. Cunningham, Chief
Radiation Protection Branch
Division of Radiation Protection
and Emergency Preparedness
Office of Nuclear Reactor Regulation

Enclosure:
As stated

CONTACT:
Dan Carter
FTS 492-1848

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Add: Daniel Carter 10D-4

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

September 20, 1991

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Enclosure

HEALTH PHYSICS POSITION ON THE TASK QUALIFICATION OF HEALTH PHYSICS TECHNICIANS AT NUCLEAR POWER PLANTS

A request was received from Region III for clarification on the question of qualifying health physics technicians (HPTs) on specific job tasks before they are fully qualified ANSI technicians.

ANSI/ANS 3.1, 1987 (Selection, Qualification and Training of Personnel for Nuclear Power Plants) states in part that while in an initial training program an HPT may not make decisions (give authorization) or take actions affecting plant safety until they meet the performance requirements of the job position assigned. However, they may independently perform specific tasks or job assignments for which they are qualified.

HPTs are allowed to perform (without supervision) specific tasks or job assignments (i.e., radiation surveys, swipe surveys, air samples, and survey meter calibrations) if they meet the required prerequisites and complete the required task qualifications of their plant training program. However, there are certain tasks that require in-depth knowledge that only fully qualified and experienced personnel can perform.

The following general items are examples of areas which a non-fully qualified HPT should not be authorized to perform (without supervision):

- The free release of radioactive materials from the restricted area
- Approval of effluent release permits
- Approval of radiation work permits
- Receipt and shipping of radioactive material

Also, as examples in the area of Emergency Preparedness, a non-fully qualified HPT should not be authorized to:

- Lead emergency search and rescue teams
- Lead environmental monitoring teams
- Perform offsite dose assessment

Each INPO accredited licensee training program will vary somewhat in its approach on qualifying its HPTs. However, each program should be based on a systems approach to training (SAT). This SAT should include the following key areas: how were criteria derived to select tasks to be done without supervision, and how are HPTs evaluated against these criteria to permit/authorize them to work unsupervised?

New Hampshire
Yankee

Ted C. Feigenbaum
President and
Chief Executive Officer

NYN- 91151

September 17, 1991

United States Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406

Attention: Mr. Thomas T. Martin, Regional Administrator

References: (a) Facility Operating License No. NPF-86, Docket No. 50-443.

(b) Public Meeting Between New Hampshire Yankee and the NRC conducted on June 21, 1991.

(c) NHY Letter NYN-91100 dated June 26, 1991, "Request for Inspection Report and Clarification of Radiograph Quality Issues," T. C. Feigenbaum to T. T. Martin.

(d) NRC Letter dated June 27, 1991, Response to NHY Letter NYN-91100 dated June 26, 1991, T. T. Martin to T. C. Feigenbaum.

(e) NRC Notice of Violation Regarding Inspection Report 50-443/91-12, dated June 28, 1991.

(f) NHY Letter NYN-91106 dated July 8, 1991, "Reply to Notice of Violation Regarding Inspection Report 50-443/91-12," T. C. Feigenbaum to T. T. Martin.

(g) NHY Letter NYN-91134 dated August 30, 1991, "August 1991 Final Status Report for the Program for the Reverification of Pullman-Higgins Field Weld Records," T. C. Feigenbaum to T. T. Martin.

(h) NHY Letter NYN-91142 dated September 6, 1991, "Pullman-Higgins Weld Radiograph Reinterpretation Program," T. C. Feigenbaum to NRC Document Control Desk.

(i) NRC Letter dated September 16, 1991, "Review of September 6, 1991 Letter Detailing the Pullman-Higgins Weld Radiograph Reinterpretation Program," T.T. Martin to T.C. Feigenbaum.

Subject: Additional Reply to Notice of Violation (NRC Inspection Report 50-443/91-12) and Radiograph Reinterpretation Program Completion Report

Dear Mr. Martin:

In the letter dated July 8, 1991 (NYN-91106) [Reference (f)], NHY committed to provide the results of short term corrective actions taken in response to the NRC Notice of

Violation [Reference (e)]. In the letters dated August 30, 1991 (NYN-91134) [Reference(g)] and September 6, 1991 (NYN-91142) [Reference (h)], NHY provided the results of these short term corrective actions. In the letter dated July 8, 1991 (NYN-91106) [Reference (f)], NHY also committed to report to the NRC, by September 15, 1991 (subsequently relaxed to September 17, 1991 upon NHY request), the results of a detailed evaluation of the short term actions for any generic implications. In the letter dated September 6, 1991 (NYN-91142) [Reference (h)], NHY provided the results of a detailed evaluation of such generic implications and submitted a Program Description for the Reinterpretation of Pullman-Higgins Field Weld Radiographs.

This letter transmits the results of implementing the Weld Radiograph Reinterpretation Program (WRRIP) described in the letter dated September 6, 1991 (NYN-91142) [Reference (h)].

This letter also transmits the results and conclusions that NHY has drawn from the various reviews conducted by NHY, by independent industry experts, and by the NRC over the past eighteen months. The results and conclusions are as follows:

1. Without exception, all field welds required to be radiographed by Code were found to have been radiographed and approved.

2. With the exception of four (4) weld radiograph packages (now corrected), all radiography for field welds which require radiography by Code were retained in NHY's records vault.

3. The concerns that have been identified regarding film quality are limited to the set of radiographs of Pullman-Higgins field welds that required radiography in order to meet the ASME Code, that is three (3) inch nominal pipe size and smaller, where the initial Pullman-Higgins Level II (or III, where the only Pullman-Higgins review was performed by a Level III) review signature occurred prior to October 1, 1982, and where the double wall exposure, double wall viewing radiographic technique was used with source side penetrameters, excluding any welds previously accepted by the NRC.

4. Of the above population of radiographs, a 100% reinterpretation was conducted and all questionable radiographs were reradiographed.

5. As a result of the reviews performed by NHY and others, it is concluded that there is no question of physical integrity for any field welds.

6. The completion of the corrective actions described above both bound and resolve the identified concerns described above, and, therefore, NHY concludes that there are no remaining unresolved film quality concerns for field welds requiring radiography by Code. Based on these conclusions, NHY further concludes that the Pullman-Higgins field weld concerns raised at Seabrook Station have been fully examined and resolved.

Should you have any questions regarding this matter, please contact Mr. Neal A. Pillsbury, Director of Quality Programs, at (603) 474-9521, extension 3341.

Very truly yours,

Ted C. Feigenbaum

Enclosure
TCF:EWD/ss

cc: Mr. Gordon E. Edison, Sr. Project Manager
Project Directorate I-3
Division of Reactor Projects
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Mr. Ebe C. McCabe, Chief
Reactor Projects Section
U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406

Document Control Desk
United States Nuclear Regulatory Commission
Washington, D.C. 20555

Mr. William Bateman
Regional Operations Staff Chief
Office of the Executive Director for Operations
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

Mr. Phil Joukoff
U.S. Nuclear Regulatory Commission
1450 Maria Lane, Suite 210
Walnut Creek, CA 94596

Mr. Frank Forgione, Special Agent
Office of the Inspector General
U.S. Nuclear Regulatory Commission
MNBB 6715
Washington, DC 20555

Mr. Noel Dudley
NRC Senior Resident Inspector
P.O. Box 1149
Seabrook, NH 03874

ENCLOSURE TO NYN-91151
ADDITIONAL RESPONSE TO NOTICE OF VIOLATION
(NRC INSPECTION REPORT 50-443/91-12)AND FINAL RESULTS
OF THE PROGRAM FOR REINTERPRETING PULLMAN-HIGGINS
FIELD WELD RADIOGRAPHS

ADDITIONAL RESPONSE TO NOTICE OF VIOLATION (NRC IR 50-443/91-12) AND FINAL RESULTS OF THE PROGRAM FOR REINTERPRETING PULLMAN-HIGGINS FIELD WELD RADIOGRAPHS

A. Background

In the letter dated July 8, 1991 (NYN-91106) [Reference (f)], NHY committed to provide the results of a detailed evaluation of any generic issues as well as the results of all short term corrective actions taken in response to the NRC Notice of Violation resulting from NRC Inspection Report 50-443/91-12. In the letters dated August 30, 1991 (NYN-91134) [Reference (g)], and September 6, 1991 (NYN-91142) [Reference (h)], NHY provided the results of the short term corrective actions. These letters respectively provided:

- the results of the Weld Record Reverification Program (WRRP) including the reradiography for the four (4) missing radiograph record packages and a root cause analysis of these occurrences; and,

- the results of the reradiography of the six (6) welds cited in the NRC Inspection Report 50-443/91-12 as well as the reradiography of one (1) weld resulting from NRC Inspection 91-27.

The NRC reviewed the film from the reradiography of these eleven (11) welds during the week of August 26, 1991. The NRC orally indicated that the field welds and film quality for all eleven (11) field welds was acceptable. The following table lists the eleven field welds and the appropriate references.

Field Weld	Reference
1-CS-328-02-F0204	WRRP, NYN-91023
1-CS-360-08-F0801	WRRP, NYN-91092 and NYN-91093
1-CBS-1201-07-F0701	WRRP, NYN-91105
1-FI-188-01-F0150	WRRP, NYN-91130
1-CS-355-05-F0501	Inspection Report 91-12
1-CS-355-01-F0109	Inspection Report 91-12
1-CS-255-08-F0801	Inspection Report 91-12
1-CS-355-01-F0102	Inspection Report 91-12
1-CS-302-04-F0404	Inspection Report 91-12
1-CS-318-02-F0202	Inspection Report 91-12
1-CS-318-02-F0205	Preliminary results of NRC Inspection 91-27

In the letters dated July 8, 1991 (NYN-91106) [Reference (f)], and September 6, 1991 (NYN-91142) [Reference (h)], NHY also respectively committed to:

- analyze the results from the short term corrective actions taken in response to the Notice of Violation from Inspection Report 91-12 for generic implications and any potential need for longer term corrective actions; and,

- implement a Weld Radiograph Reinterpretation Program (WRRIP) for a specific population of Pullman-Higgins field welds.

This report provides the results of the extensive actions taken by NHY, and an independent expert in the field of radiography (Hellier Associates, Inc.), in response to these two commitments. Section B of this report addresses the analysis of short term corrective action results for generic implications and any potential need for longer term corrective actions. Section C of this report provides the results of the WRRIP for a specific population of Pullman-Higgins field welds. Section D of the report provides the conclusions that NHY has drawn as a result of these comprehensive, independent reviews plus other available data.

B. Generic Weld Program Issues

In NYN-91106, dated July 8, 1991 [Reference (f)], NHY committed to a detailed analysis of generic issues stemming from the final results of the Weld Record Re-verification Program (WRRP) and the reradiography of the six (6) welds addressed in the Notice of Violation. The letter dated August 30, 1991 (NYN-91134) [Reference (g)] provided the results of the WRRP including the conclusions drawn from a root cause analysis performed on the anomalies reported to the NRC. Those anomalies consisted of weld records problems that have been grouped into the following three categories:

- missing radiographs and radiographic inspection reports (total of 4);
- incomplete radiograph identification (total of 2); and,
- unacceptable film comparative density (total of 1).

NHY conducted a Kepner-Tregoe type root cause analysis, which concluded that the observed records anomalies were isolated incidents and did not result from a deficient Pullman-Higgins records management program. The root cause analysis further concluded that no additional corrective actions beyond those already identified in the specific Corrective Action Requests were necessary.

NHY completed the reradiography of the six (6) welds addressed in the Notice of Violation during the week of August 26, 1991. Prior to initiating a detailed analysis of these six welds for potential generic implications, and following the identification of an additional weld radiograph package of concern as a result of NRC Inspection 91-27, the NRC requested that NHY develop a program to further analyze a specific population of Pullman-Higgins field weld radiographs. In the letter dated September 6, 1991 (NYN-91142) [Reference (h)], NHY provided a Weld Radiograph Reinterpretation Program Description (WRRIP), which outlined the analysis that derived the common factors, the population of welds with these factors, the review method to be utilized and potential corrective actions that could be taken to resolve any anomalies identified as a result of the WRRIP implementation. Therefore, the analysis section of the aforementioned WRRIP Description constitutes the detailed analysis for any potential generic implications that NHY had committed to provide in NYN-91106, dated July 8, 1991 [Reference (f)]. This program has been reviewed and accepted by the NRC in a letter from T.T. Martin to T.C. Feigenbaum, dated September 16, 1991 [Reference (i)].

The NHY analysis included all of the field welds for which the NRC identified concerns regarding radiographic film quality during NRC inspections conducted in May, June, and August 1991. The NHY analysis focused on a number of different parameters that were generically applicable to this small population of radiographic packages and which were of possible common factor concern. The parameters evaluated included the following:

- system
- pipe size
- pipe wall thickness
- type of connection
- date of review
- radiographic technique
- type of film
- number and level of reviews conducted
- RT reviewer involved
- type of rejection

This analysis resulted in the following conclusions:

1. The Welding and QA Program enhancements implemented subsequent to October 1, 1982 were effective.

2. Certain parameters were identified for which strict compliance with certain Code film quality requirements for a specific population of field welds was not achieved. The WRRIP Description submitted in NYN-91142 dated September 6, 1991 [Reference (h)], details these parameters.

3. Other than for this specific population of welds, the NRC has conducted a number of other sample reinterpretations. These NRC inspections provide a high confidence level that all other field welds meet the full Code and Regulatory requirements applicable to film quality, radiographic techniques and physical weld quality.

Based on these conclusions NHY implemented the WRRIP for welds which satisfy the following parameters:

> Any Pullman-Higgins field welds that required radiography in order to meet the ASME Code, that is three (3) inch nominal pipe size and smaller, where the initial Pullman-Higgins Level II (or III, where the only Pullman-Higgins review was performed by a Level III) review signature occurred prior to October 1, 1982, and where the double wall exposure, double wall viewing radiographic technique was used with source side penetrameters, excluding any welds previously accepted by the NRC.

As described in the WRRIP Description, NHY selected the October 1, 1982 date based on a number of welding program improvement actions committed to on September 27, 1982. For example, there was a commitment made to perform an additional Pullman-Higgins Level III review of each radiographic package before sending the package to the Yankee

Atomic Electric Company (YAEC) NDE Review Group for review and final weld acceptance. This commitment is documented in an NHY letter dated September 27, 1982 (SBN-334), which responded to a notice of violation regarding radiography as identified in the NRC Construction Assessment Team Inspection Report 82-06. Recent NRC reviews of radiography substantiate that radiographic quality improved following implementation of the referenced commitments on September 27, 1982. Specifically, at the August 23, 1991 exit meeting for NRC Inspection 91-27, the NRC Inspection Team Leader indicated that based upon a reinterpretation of 58 welds over the entire construction era, there was a perceptible improvement in the quality of radiographs performed during the last quarter of 1982, and a progressively positive improvement thereafter.

In order to verify that the selection of the parameters was in fact the appropriate set of bounding conditions for the program, NHY reviewed samples of radiographic film packages for two additional populations of field welds that shared key parameters used to envelope the reinterpretation effort. The first of these additional population samples included field weld radiographic packages meeting all of the program population parameters with the exception of the October 1, 1982 date of initial Pullman-Higgins review. NHY identified the entire population of field welds with these parameters. For those welds where the initial Pullman-Higgins Code required review occurred after October 1, 1982 the identified welds were placed in chronological order according to the date of initial Pullman-Higgins review. NHY and Hellier Associates, Inc. reviewed a total of twenty (20) of the radiographic packages in the period immediately following October 1, 1982, and documented that each of them complied with the Code requirements. Table 1 from Attachment A provides the results of this additional sample. This sample confirmed the effectiveness of program enhancements and corrective actions taken to improve the construction era radiographic examination process.

The second bounding conditions analysis, carried out in order to confirm that the proper selection of key program parameters had occurred, involved a research of the field weld radiographic packages that were three (3) inch nominal pipe size and smaller but involved a different radiographic filming technique. This analysis included radiographs taken during the entire construction era. The pipe size included in the WRRIP Description is constrained by Code requirements. The Code allows use of this technique only for piping that is three and one-half (3 1/2) inches outside diameter and smaller. Therefore, the focus of this analysis was to confirm the applicability of the double wall exposure, double wall viewing, source side penetrameter radiographic technique as an appropriate parameter. Table 2 from Attachment A provides the results of this additional analysis. This analysis confirmed that the selection of the technique parameter was correct. Out of a collective total of 59 previous and current independent examinations of radiography performed by a different technique (double wall exposure, single wall viewing), all were found to be acceptable.

As a result of the WRRIP completion on September 16, 1991, NHY has drawn the following conclusions:

1. The WRRIP scope was appropriate. The two additional bounding conditions analyses have confirmed that the bounding conditions established for the Program were correct.

2. The WRRIP identified two types of film quality anomalies whereby not all film of record from the construction phase was found to be in strict compliance with all Code criteria. These film quality issues were specific to a single radiographic technique and where the initial Code required Pullman-Higgins film review occurred prior to October 1, 1982.

3. Although there were film quality deviations, none of the 47 film packages involved indicated any evidence of a physical weld integrity concern.

4. The reradiography results for each of the 47 films have confirmed the original construction reviewer conclusions regarding code acceptable physical weld quality. The recently completed reradiography has also provided a radiographic film package record set, for each of the 47 welds, which is in full compliance with Code and Regulatory requirements.

Section C of this report provides the results of implementing the WRRIP.

C. Weld Reinterpretation Program Results

C.1 NHY Reinterpretation Results

As committed to in the WRRIP Description, NHY conducted two, parallel 100 percent reinterpretations of the radiograph packages for the specified weld population. The NHY review, done by YAEC and Stone & Webster RT Level III certified examiners, was conducted to provide early identification of any common factors of concern. It was also conducted to better coordinate any potential reradiography with other work currently being performed as part of the refueling outage.

As described in the WRRIP Description, the initial population of welds that satisfied the common factors criteria was 152. The WRRIP Description also indicated that the total population of welds was a preliminary estimate which was subject to further verification. Further reviews, conducted subsequent to the submittal of the WRRIP Description, increased the total population of welds to 185. These 185 welds are listed in Table 3 of Attachment A. Thirty-six (36) of these welds had been previously reviewed by the NRC. Of the resultant 149 welds, 59 had been reradiographed by Pullman-Higgins after the October 1, 1982 date. Of the 59 reshots, 58 were performed utilizing a different technique (e.g., double wall exposure, single wall viewing), and one (1) was performed using the original technique of double wall exposure, double wall viewing, with source side penetrameters. The resultant population of weld radiograph packages to be reviewed was 90. However, since the actual reinterpretation effort was initiated early in the process, NHY actually reviewed six (6) additional welds outside the population for a total of 96 weld radiograph packages. The NHY reinterpretation was conducted in accordance with the method provided in the WRRIP Description.

The NHY reinterpretation effort concluded that 100 percent of the physical welds reviewed had no apparent indications, therefore, being acceptable per the ASME Code. However, the reinterpretation indicated that while the radiographs generally met the intent of the Code, 47 of the 90 weld radiograph packages cannot conservatively demonstrate strict compliance with all film quality requirements prescribed by the Code. The Code

requirements not conservatively met were inadequate film coverage of the weld circumference due to density variations and penetrameter sensitivity. NHY reradiographed all 47 welds regardless of the nature or degree of the film quality concerns. The reradiography actions taken to address these film quality concerns are presented in Section C.3 of this report.

NHY conducted an analysis of the 47 film quality concerns to determine if they indicated any additional common factors not previously considered in the identification of the subject population of welds. No additional common factors were identified which would further limit or expand the subject population of welds.

C.2 Hellier Reinterpretation Results

As also committed to in the Program Description, an independent expert in the field of radiography, Mr. Charles J. Hellier personally conducted a reinterpretation of the radiograph packages of the subject population of welds. His review included a total of 100 weld radiograph packages which encompassed 100 percent of the subject population of 90 welds. The ten (10) weld radiograph packages in excess of the 90 which were specified were reviewed before the subject population of welds was finalized. The results of Mr. Hellier's reinterpretation efforts are documented in "Hellier Report #919-12D," which is provided as Attachment B to this letter. Mr. Hellier independently concluded that 47 of the 100 weld radiograph packages reviewed were found not to be in strict compliance with the ASME Code requirements; 44 due to inadequate coverage based on Code density requirements, and three (3) due to unacceptable film quality, such as the penetrameter hole not being visible. The 47 radiograph packages independently found to be in non-compliance with the Code by Mr. Hellier are the same 47 packages that were identified in the NHY review. In addition, the 43 radiograph packages independently found to be in compliance with Code by Mr. Hellier are the same 43 package that were found to be acceptable in the NHY review. Mr. Hellier's conclusions were in agreement with NHY's conclusions for the subject populations of 90 and 47 welds. Mr. Hellier also states in his report that the reinterpretation effort did not disclose any apparent concerns regarding weld quality.

C.3 Corrective Actions

NHY has completed the reradiography to address the weld radiograph film quality concerns identified as part of the NHY and Hellier reinterpretation efforts. Specifically, NHY has reradiographed all 47 of the subject welds discussed above. These radiographs were interpreted by qualified NHY, YAEC and Stone & Webster Level II and III reviewers and were found to be acceptable per the Code. These new radiographs substantiate and confirm that the original welds were in compliance with the Code. Additionally, the new radiographs also comply with the film quality requirements contained in the Code. These new radiographs have also been independently reviewed by Hellier Associates, Inc., Level III RT certified personnel who also conclude that the welds and their radiographs fully comply with the requirements of the Code. These new radiographs and their radiographic inspection reports, as completed by the NHY, YAEC, Stone & Webster and independent Hellier Associates, Inc. Level III RT certified personnel, have been included in the NHY Records Management System.

D. Conclusions

The function of the Code and regulatory requirements applicable to nondestructive examination by the radiographic method is to ensure physical integrity of welds and to ensure the retention of required quality documentation. These requirements were incorporated into programs and procedures used to construct Seabrook Station. These procedures ensured the following:

- that field welds requiring radiography by Code were radiographed;
- that the radiographs were reviewed and approved by qualified individuals to ensure physical weld quality; and,
- that the radiographic records were retained for the physical life of the weld.

The multiple, comprehensive reviews conducted by NHY and a number of independent experts demonstrated that, with the exception of certain deviations identified as a result of the WRRP and the WRRIP, these requirements were met at the end of construction. These experts are highly regarded by both the NRC and their peers in the industry in terms of credentials, integrity and reputation in the welding radiography field. The corrective actions taken in response to the comprehensive reviews conducted over the past 18 months have resulted in further assurance of compliance with Code and regulatory requirements. NHY, by way of these reviews and corrective actions, concluded the following:

1. Without exception, all field welds required to be radiographed by Code were found to have been radiographed and approved.

2. With the exception of four (4) weld radiograph packages (now corrected), all radiography for field welds which require radiography by Code were retained in NHY's records vault.

3. The concerns that have been identified regarding film quality are limited to the set of radiographs of Pullman-Higgins field welds: that required radiography in order to meet the ASME Code, that is three (3) inch nominal pipe size and smaller, where the initial Pullman-Higgins Level II (or III, where the only Pullman-Higgins review was performed by a Level III) review signature occurred prior to October 1, 1982, and where the double wall exposure, double wall viewing radiographic technique was used with source side penetrameters, excluding any welds previously accepted by the NRC.

4. Of the above population of radiographs, a 100% reinterpretation was conducted and all questionable radiographs were reradiographed.

5. As a result of the reviews performed by NHY and others, it is concluded that there is no question of physical integrity for any field welds.

6. The completion of the corrective actions described above both bound and resolve the identified concerns described above, and, therefore, NHY concludes that there are no remaining unresolved film quality concerns for field welds

requiring radiography by Code. Based on these conclusions, NHY further concludes that the Pullman-Higgins field weld concerns raised at Seabrook Station have been fully examined and resolved.

The following provides the bases for the above stated conclusions.

D.1 Radiography Performed During Construction

Per the results of the WRRP, submitted on August 30, 1991 [Reference (g)], all field welds which require radiography by code were identified and verified to have been radiographed. The WRRP identified that although all radiography was performed during construction, four weld radiograph packages had not been retained in the site records vault. The four welds have subsequently been reradiographed, and this discrepancy has been corrected.

D.2 Weld Radiograph Packages Are Now Complete and On File

The results and corrective measures from the WRRP, submitted with NYN-91134, dated August 30, 1991 [Reference (g)], substantiate that NHY now retains all of the radiograph packages for field welds requiring radiographic examination by Code. These results confirm that NHY fully complies with the Code and Regulatory requirements for records retention and retrievability. The WRRP results further demonstrate that every required radiograph package retained in the records vault has been reviewed and approved per Code, Regulatory and Site procedural and program requirements.

D.3 Welds With a Cloud on Thread of Film Quality Concerns

Table 4 of Attachment A lists 269 field welds that require radiography by Code and are specifically identified in NRC Inspection Reports from 1980 to present, and NUREG-1425. The NRC has reviewed the radiographic film packages for each of these welds. The 269 field welds constitute a minimum review sample of 10 percent from the total population of field welds requiring radiography by Code (2669 field welds). The NRC has also inspected an additional population of 488 field welds as a result of reviews conducted during the construction phase. However, these welds were not specifically identified. The Inspection Reports indicate that some portion of this additional population of field welds included a review of the radiographic film. As evidenced in Table 4 of Attachment A, the NRC reviewers rejected a total of twelve (12) field welds[1] from the field welds that they reviewed.

Four of the twelve deficiencies occurred during the construction period. NHY addressed and resolved those four deficiencies identified by the NRC, and where appropriate, generic corrective actions were incorporated in the overall weld programs and procedures.

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[1]Table 4 of Attachment A includes only eleven (11) of the twelve (12) rejected welds. Pullman-Higgins field weld 1-CS-369-10-F1006, is not listed on this table since it no longer exists.

Eight (8) of the twelve (12) NRC rejections occurred during the recent NRC Inspections (91-12, 91-27, and NUREG-1425) where the eight (8) sets of weld radiography were found to be not in full compliance with Code requirements. For the one weld deficiency identified in NUREG-1425, NHY determined that the weld was adequate for the design service conditions, and no further corrective actions were required. NHY had disputed six (6) of the remaining seven (7) NRC findings in NYN-91106, dated July 8, 1991 [Reference (f)]. Notwithstanding, all seven welds were reradiographed.

As described in NYN-91142, dated September 6, 1991 [Reference (h)], the NRC requested that NHY analyze the seven (7) welds found to be unacceptable in NRC Inspections 91-12 and 91-27, for common factors and to develop a self inspection program for welds that met these factors. The NHY analysis included all of the field welds for which the NRC identified concerns regarding radiographic film quality during NRC inspections conducted in May, June, and August 1991. The NHY analysis focused on a number of different parameters which were generically applicable to this small population of radiographic packages and which were of possible common factor concern. The results of this analysis concluded that the following parameters were those factors which could have generic implications:

- Any Pullman-Higgins field weld, that required radiography in order to meet the ASME Code, that is three (3) inch nominal pipe size and smaller, where the initial Pullman-Higgins Level II (or III, where the only Pullman-Higgins review was performed by a Level III) review signature occurred prior to October 1, 1982, and where the double wall exposure, double wall viewing radiographic technique was used with source side penetrameters, excluding any welds previously accepted by the NRC.

NHY has completed the implementation of the WRRIP Description submitted in NYN-91142, dated September 6, 1991 [Reference (h)]. This program used the criteria presented in Section B of this report to define the population of welds to be reviewed as part of the radiographic film reinterpretation effort.

NHY also reviewed additional weld radiographic film packages in order to verify that the selection of the key parameters was in fact the appropriate set of bounding conditions for the program. The first of these additional population samples included field weld radiographic packages meeting all of the program population parameters with the exception of the October 1, 1982 date of initial Pullman-Higgins review. NHY and Hellier Associates, Inc. reviewed a total of twenty (20) of the radiographic packages in the period immediately following October 1, 1982, and documented that each of them complied with the Code requirements. This sample confirmed the effectiveness of program enhancements and corrective actions taken after October 1, 1982, to improve the construction era radiographic examination process.

The second bounding conditions analysis, carried out in order to confirm that the proper selection of key program parameters had occurred, involved a research of the field weld radiographic packages that were three (3) inch nominal pipe size and smaller but involved a different radiographic filming technique. This analysis included radiographs taken during the entire construction era. This analysis confirmed the selection of the double wall exposure, double wall viewing with source side penetrameter radiographic technique as a

valid bounding parameter in that out of a collective total of 59 previous and current independent weld examinations, of radiography performed by a different technique (double wall exposure, single wall viewing), all were found to be acceptable.

NHY continued evaluation of the 47 film quality concerns throughout the course of implementation of the WRRIP in order to determine if there were any additional common factors not previously considered in the identification of the subject population of welds. No additional common factors were identified which would further limit or expand the subject population of welds.

Finally, an evaluation of the nature of the particular radiographic technique common to the radiographs of concern leads to the conclusion, shared by NHY and Hellier, that the geometry of this technique presents unique difficulties associated with meeting the strict requirements of the Code. This supports the NHY reviewed data and resultant conclusion that the identified subpopulation bounds the issue.

D.4 Reinterpretation for Weld Population of Concern, and Reradiography Performed as Required

The 100 percent reinterpretation of the weld population of concern indicated that while the radiographs generally met the intent of the Code, 47 of 90 weld radiograph packages cannot conservatively demonstrate strict compliance with all film quality requirements. NHY reradiographed all 47 welds regardless of the nature or degree of the film quality concerns. The resultant radiographs were reviewed, independently checked, and verified to meet Code requirements.

D.5 No Weld Integrity Implications

As a result of the reviews performed by NHY and others, it is concluded that there is no question of physical integrity for any field welds.

D.6 Weld Set of Concerns Appropriately Bounded and Resolved

The basis for the conclusion that the concerns have been appropriately bounded and resolved is set forth in Section D.3 above, and the basis for the conclusion that they have been appropriately resolved is set forth in Section D.4 above.

ATTACHMENT A

LEGEND FOR TABLES 1 - 4 OF ATTACHMENT A

LEGEND	RADIOGRAPHIC TECHNIQUE
A	DOUBLE WALL EXPOSURE, SINGLE WALL VIEWING
B	DOUBLE WALL EXPOSURE, DOUBLE WALL VIEWING, SOURCE SIDE PENETRAMETER
C	PANORAMIC
D	SINGLE WALL EXPOSURE, SINGLE WALL VIEWING

NOTES

1. INITIAL PULLMAN-HIGGINS (P-H) REVIEW IS FOR ORIGINAL RADIOGRAPHS EXCLUSIVE OF ANY RESHOTS
2. RADIOGRAPHIC TECHNIQUE LISTED IS FOR FINAL ACCEPTANCE RADIOGRAPHS

TABLE 1 - WELD RADIOGRAPH PACKAGES REVIEWED BY NRC OR NHY WHERE INITIAL PH REVIEW IS AFTER 10/1/82

WELD ID	SIZE	TECHNIQUE USED FOR FINAL ACCEPTANCE	INITIAL PH REVIEW	REVIEWED BY NRC- REFERENCE	WRRIP REVIEW	WRRIP RESULTS
1-CS-318-04-F0405	2"	B	05/16/83	NO	YES	MEETS CODE
1-CS-328-08-F0818	2"	B	10/19/83	91-27	NO	N/A
1-CS-351-03-F0301	1 1/2"	B	03/30/83	NO	YES	MEETS CODE
1-CS-351-03-F0302	1 1/2"	B	3/24/83	NO	YES	MEETS CODE
1-CS-360-10-F1001	2"	B	05/26/83	NO	YES	MEETS CODE
1-CS-360-10-F1003	2"	B	05/21/83	NO	YES	MEETS CODE
1-CS-365-01-F0104	2"	B	03/09/83	NO	YES	MEETS CODE
1-CS-365-01-F0108	2"	B	03/09/83	NO	YES	MEETS CODE
1-CS-365-04-F0402	2"	B	03/09/83	NO	YES	MEETS CODE
1-CS-365-04-F0407	2"	B	03/09/83	NO	YES	MEETS CODE
1-CS-365-04-F0408	2"	B	03/09/83	NO	YES	MEETS CODE
1-CS-365-04-F0409	2"	B	03/09/83	NO	YES	MEETS CODE
1-CS-366-02-F0205	2"	B	12/16/82	NO	YES	MEETS CODE
1-RC-15-01-F0103	2"	B	01/18/83	NO	YES	MEETS CODE
1-RC-15-01-F0104	2"	B	01/18/83	NO	YES	MEETS CODE
1-RC-15-01-F0105	2"	B	01/19/83	NO	YES	MEETS CODE
1-RC-15-01-F0106	2"	B	01/20/83	NO	YES	MEETS CODE
1-RC-44-01-F0104	2"	B	05/31/83	NO	YES	MEETS CODE
1-RC-45-01-F0107	2"	B	10/31/83	NUREG 1425	NO	N/A
1-RC-59-02-F0201	2"	B	01/17/83	NO	YES	MEETS CODE
1-RC-59-02-F0202	2"	B	01/17/83	NO	YES	MEETS CODE
1-RC-59-02-F0203	2"	B	01/17/83	NO	YES	MEETS CODE

TABLE 1 - WELD RADIOGRAPH PACKAGES REVIEWED BY NRC OR NHY WHERE INITIAL PH REVIEW IS AFTER 10/1/82

WELD ID	SIZE	TECHNIQUE USED FOR FINAL ACCEPTANCE	INITIAL PH REVIEW	REVIEWED BY NRC-REFERENCE	WRRIP REVIEW	WRRIP RESULTS
1-RC-91-F410005-F002	3"	B	10/19/84	NUREG 1425	NO	N/A
1-RC-91-F410005-F005	3"	B	10/03/84	NUREG 1425	NO	N/A
1-SI-251-11-F1107	2"	B	02/12/85	85-19	NO	N/A
1-SI-273-02-F0203	1 1/2"	B	08/24/84	NUREG 1425	NO	N/A
1-SI-275-01-F0104	1 1/2"	B	12/21/84	NUREG 1425	NO	N/A

TABLE 2 - WELD RADIOGRAPH PACKAGES WITH SINGLE WALL VIEWING TECHNIQUE REVIEWED BY NHY OR NRC

WELD ID	SIZE	TECHNIQUE USED FOR FINAL ACCEPTANCE	INITIAL PH REVIEW	REVIEWED BY NRC REFERENCE	WRRIP REVIEW	WRRIP RESULTS
1-CS-302-02-F0209	3"	A	05/02/83	91-27	NO	N/A
1-CS-302-02-F0210	3"	A	07/01/83	91-27	NO	N/A
1-CS-332-02-F0201	3"	A	04/11/84	91-27	NO	N/A
1-CS-355-12-F1203	3"	A	06/07/83	91-12	NO	N/A
1-CS-358-05-F0502	3"	A	01/22/85	91-27	NO	N/A
1-CS-360-01-F0102	3"	A	01/09/85	91-27	NO	N/A
1-CS-360-02-F0204	3"	A	12/10/84	91-12	NO	N/A
1-CS-360-02-F0206	3"	A	05/27/82	91-12	NO	N/A
1-CS-360-09-F0902	3"	A	05/15/81	NO	YES	MEETS CODE
1-CS-364-03-F0301	3"	A	07/24/82	NUREG 1425	NO	N/A
1-CS-365-01-F0101	2"	A	03/22/83	NUREG 1425	NO	N/A
1-CS-365-01-F0111	2"	A	11/07/83	NUREG 1425	NO	N/A
1-CS-366-02-F0203	3"	A	08/13/82	NUREG 1425	NO	N/A
1-CS-366-02-F0204	3"	A	08/25/82	91-12	NO	N/A
1-CS-366-05-F0502	3"	A	04/05/83	91-27	NO	N/A
1-CS-375-01-F0115	3"	A	01/16/84	91-27	NO	N/A
1-CS-377-01-F0103	3"	A	01/16/84	NUREG 1425	NO	N/A
1-CS-388-06-F0602	3"	A	10/27/82	91-27	NO	N/A
1-CS-416-F410310-F036	3"	A	11/14/84	91-27	NO	N/A
1-CS-431-02-F0203	3"	A	07/15/85	NUREG 1425	NO	N/A
1-CS-432-02-F0203	3"	A	07/18/85	91-12	NO	N/A
1-CS-432-03-F0304	3"	A	08/17/82	91-12	NO	N/A

TABLE 2 - WELD RADIOGRAPH PACKAGES WITH SINGLE WALL VIEWING TECHNIQUE REVIEWED BY NHY OR NRC

WELD ID	SIZE	TECHNIQUE USED FOR FINAL ACCEPTANCE	INITIAL PH REVIEW	REVIEWED BY NRC REFERENCE	WRRIP REVIEW	WRRIP RESULTS
1-CS-499-03-F0314	3"	A	08/10/39	91-27	NO	N/A
1-CS-499-06-F0603	3"	A	07/14/85	91-27	NO	N/A
1-CS-523-01-F0101	3"	A	07/15/85	NUREG 1425	NO	N/A
1-CS-523-02-F0203	3"	A	05/18/83	91-27	NO	N/A
1-CS-523-02-F0204	3"	A	07/30/85	91-27	NO	N/A
1-RC-15-04-F0403	2"	A	08/13/84	NUREG 1425	NO	N/A
1-RC-15-05-F0502	2"	A	04/04/84	91-27	NO	N/A
1-RC-15-05-F0504	3"	A	02/11/84	NUREG 1425	NO	N/A
1-RC-30-01-F0101	3"	A	03/22/84	NUREG 1425	NO	N/A
1-RC-30-01-F0103	3"	A	11/22/82	NUREG 1425	NO	N/A
1-RC-30-03-F0303	3"	A	08/31/83	NUREG 1425	NO	N/A
1-RC-30-04-F0401	2"	A	03/29/84	91-27	NO	N/A
1-RC-30-07-F0705	2"	A	04/09/84	91-27	NO	N/A
1-RC-33-04-F0401	2"	A	06/05/84	NUREG 1425/91-27	NO	N/A
1-RC-44-05-F0501	3"	A	02/06/84	NUREG 1425	NO	N/A
1-RC-59-04-F0405	3"	A	02/06/84	NUREG 1425	NO	N/A
1-RC-59-05-F0502	3"	A	[illegible]/83	NUREG 1425	NO	N/A
1-RC-59-06-F0602	3"	A	[illegible]7/83	NUREG 1425	NO	N/A
1-RC-32-01-F0106	2"	A	02/06/84	NUREG 1425	NO	N/A
1-RC-96-F410018-F001	2"	A	10/20/84	NUREG 1425	NO	N/A
1-RC-96-F410018-F004	2"	A	09/11/84	NUREG 1425	NO	N/A

TABLE 2 - WELD RADIOGRAPH PACKAGES WITH SINGLE WALL VIEWING TECHNIQUE REVIEWED BY NHY OR NRC

WELD ID	SIZE	TECHNIQUE USED FOR FINAL ACCEPTANCE	INITIAL PH REVIEW	REVIEWED BY NRC REFERENCE	WRRIP REVIEW	WRRIP RESULTS
1-RC-97-02-F0203	3"	A	07/01/85	NUREG 1425	NO	N/A
1-RC-97-02-F0204	3"	A	04/03/81	NO	YES	MEETS CODE
1-RC-97-03-F0304	3"	A	09/27/82	NO	YES	MEETS CODE
1-RC-97-03-F0309	3"	A	09/27/82	NO	YES	MEETS CODE
1-RC-98-F410014-F006	2"	A	02/21/84	91-12	NO	N/A
1-RMW-1102-05-F0506	3"	A	06/30/82	91-27	NO	N/A
1-SB-1307-02-F0206	3"	A	01/24/84	NUREG 1425	NO	N/A
1-SB-1307-15-F1503	2"	A	07/15/83	NUREG 1425	NO	N/A
1-SB-1310-05-F0521	3"	A	02/08/85	91-27	NO	N/A
1-SB-1310-06-F0605	3"	A	11/08/83	NUREG 1425	NO	N/A
1-SB-1310-14-F1401	2"	A	02/22/85	91-27	NO	N/A
1-SI-256-04-F0411	2"	A	01/30/84	NUREG 1425	NO	N/A

TABLE 3 - WELD RADIOGRAPH PACKAGES REVIEWED BY PH PRIOR TO 10/1/82

CVCS - PIPE TO VALVE WELDS

WELD ID	SIZE	ADDRESSED IN NRC RPT	PH REVIEW DATE-(ORIGINAL TECHNIQUE)	PH REVIEW DATE IF RESHOT AND ACCEPTED AFTER 10/1/82 (TECHNIQUE)	WRRIP RESULTS RESHOT REQUIRED
301-05-F0502*	3"		05/28/82 (B)	06/14/84 (A)	
302-04-F0402	3"		03/31/82 (B)	N/A	NO
302-04-F0403	3"	91-12	02/19/82 (B)	N/A	NO
302-04-F0404	3"	91-12	02/22/82 (B)	N/A	
303-05-F0502	3"	91-12	02/16/82 (B)	N/A	NO
303-05-F0503	3"	91-12	02/16/82 (B)	N/A	NO
303-05-F0504	3"		09/09/82 (B)	N/A	NO
303-05-F0505	3"		09/01/82 (B)	N/A	NO
318-01-F0102	3"		08/27/82 (B)	01/10/85 (A)	
318-01-F0103	3"		09/12/81 (B)	N/A	YES
318-02-F0202	3"	91-12	10/30/81 (B)	N/A	
318-02-F0205	3"	91-27	09/12/81 (B)	N/A	
318-04-F0403	3"		03/10/82 (B)	N/A	YES
318-04-F0404	3"		05/28/82 (B)	N/A	NO
324-01-F0102	3"		07/12/82 (B)	06/03/85 (A)	
340-01-F0102	3"		09/14/82 (B)	04/18/85 (A)	
340-01-F0104	3"		11/24/81 (B)	N/A	NO
340-01-F0105	3"		09/17/81 (B)	N/A	NO
355-01-F0102	3"	91-12	08/18/81 (B)	N/A	
355-01-F0103	3"		05/04/81 (B)	N/A	NO
355-01-F0104	3"	91-12	04/15/81 (B)	N/A	
355-01-F0105	3"		04/15/81 (B)	N/A	YES

NOTE: An asterisk in the "WELD ID" column represents an addition to NHY's September 6, 1991 response (NYN 91142).

TABLE 3 - WELD RADIOGRAPH PACKAGES REVIEWED BY PH PRIOR TO 10/1/82

CVCS - PIPE TO VALVE WELDS

WELD ID	SIZE	ADDRESSED IN NRC RPT	PH REVIEW DATE-(ORIGINAL TECHNIQUE)	PH REVIEW DATE IF RESHOT AND ACCEPTED AFTER 10/1/82 (TECHNIQUE)	WRRIP RESULTS RESHOT REQUIRED
355-01-F0106	3"		04/15/81 (B)	N/A	YES
355-01-F0107	3"		04/28/81 (B)	N/A	YES
355-01-F0108	3"		04/29/81 (B)	N/A	YES
355-01-F0109	3"	91-12	08/18/81 (B)	N/A	
355-01-F0112(BMR)	3"	91-27	07/03/81 (B)	N/A	
355-04-F0401	3"		12/03/81 (B)	N/A	YES
355-04-F0402	3"		11/23/81 (B)	N/A	YES
355-04-F0403	3"		05/07/82 (B)	N/A	NO
355-08-F0801	3"	91-12	07/20/82 (B)	N/A	
355-08-F0802	3"		07/08/82 (B)	N/A	NO
356-01-F0102	3"	91-12	08/27/81 (B)	N/A	
360-01-F0101	3"		07/02/82 (B)	N/A	YES
360-02-F0201	3"		09/01/82 (B)	N/A	YES
360-02-F0205	3"	91-27	06/03/82 (B)	N/A	
360-02-F0206	3"	91-12	05/27/82 (B)	01/10/85 (A)	
360-05-F0504	3"		01/02/82 (B)	N/A	YES
360-05-F0505	3"		01/21/82 (B)	07/25/84 (A)	
360-09-F0901	3"		05/11/81 (B)	N/A	NO
360-09-F0902	3"		05/15/81 (B)	01/09/85 (A)	NO
360-11-F1101	3"		03/24/81 (B)	N/A	NO
360-11-F1102	3"		07/08/82 (B)	N/A	YES
364-03-F0301	3"	NUREG 1425	07/24/82 (B)	09/29/84 (A)	
364-03-F0302	3"		05/11/81 (B)	N/A	YES
364-03-F0303	3"		05/11/81 (B)	N/A	NO

TABLE 3 - WELD RADIOGRAPH PACKAGES REVIEWED BY PH PRIOR TO 10/1/82

CVCS - PIPE TO VALVE WELDS

WELD ID	SIZE	ADDRESSED IN NRC RPT	PH REVIEW DATE-(ORIGINAL TECHNIQUE)	PH REVIEW DATE IF RESHOT AND ACCEPTED AFTER 10/1/82 (TECHNIQUE)	WRRIP RESULTS RESHOT REQUIRED
364-03-F0304	3"		04/29/81 (B)	N/A	NO
364-03-F0305	3"	91-27	05/04/81 (B)	N/A	
364-03-F0306	3"		09/09/81 (B)	N/A	YES
366-02-F0201*	3"		08/12/82 (B)	05/15/84 (A)	
366-03-F0304	3"		05/25/82 (B)	05/15/84 (A)	
368-03-F0302*	3"		08/12/82 (B)	05/15/84 (A)	
377-02-F0202*	3"		08/11/82 (A)	05/15/84 (A)	
377-02-F0203	3"		08/02/82 (B)	05/14/84 (A)	
377-03-F0302*	3"		08/12/82 (B)	07/12/84 (A)	
431-02-F0202	3"		05/19/82 (B)	06/27/84 (A)	
432-02-F0201*	3"		04/22/82 (B)	08/22/84 (A)	
432-02-F0202*	3"		05/12/82 (B)	01/07/85 (A)	
499-03-F0301	3"		05/05/82 (B)	07/25/84 (A)	

NOTE: An asterisk in the "WELD ID" column represents an addition to NHY's September 6, 1991 response (NYN 91142).

TABLE 3 - WELD RADIOGRAPH PACKAGES REVIEWED BY PH PRIOR TO 10/1/82

CVCS - PIPE OR FITTING TO COMPONENT WELDS

WELD ID	SIZE	ADDRESSED IN NRC RPT	PH REVIEW DATE-(ORIGINAL TECHNIQUE)	PH REVIEW DATE IF RESHOT AND ACCEPTED AFTER 10/1/82 (TECHNIQUE)	WRRIP RESULTS RESHOT REQUIRED
360-12-F1202	3"		02/25/82 (B)	N/A	NO
377-04-F0401	3"		08/17/82 (B)	07/12/84 (A)	
378-03-F0301	3"		08/23/82 (B)	07/13/84 (A)	

TABLE 3 - WELD RADIOGRAPH PACKAGES REVIEWED BY PH PRIOR TO 10/1/82

CVCS - PIPE TO TEE, ELBOW ETC. WELDS

WELD ID	SIZE	ADDRESSED IN NRC RPT	PH REVIEW DATE-(ORIGINAL TECHNIQUE)	PH REVIEW DATE IF RESHOT AND ACCEPTED AFTER 10/1/82 (TECHNIQUE)	WRRIP RESULTS RESHOT REQUIRED
301-05-F0503	3"		09/21/82 (B)	08/08/84 (A)	
301-06-F0601	3"		05/12/82 (B)	N/A	NO
301-06-F0602	2"		08/27/82 (B)	N/A	NO
302-01-F0103	3"		01/20/82 (B)	N/A	NO
302-03-F0301	3"		02/22/82 (B)	N/A	NO
302-03-F0302	3"	91-12	02/22/82 (B)	N/A	
302-05-F0502	3"		05/28/82 (B)	06/14/84 (A)	
303-03-F0301	3"	91-12	02/22/82 (B)	N/A	
303-03-F0303	3"		01/27/82 (B)	N/A	NO
303-04-F0401	3"		01/27/82 (B)	N/A	NO
303-05-F0501	3"		02/08/82 (B)	N/A	NO
318-01-F0101	3"		10/22/81 (B)	N/A	NO
318-02-F0204*	3"	91-12	08/02/82 (B)	N/A	
324-01-F0104	3"		07/12/82 (B)	05/09/84 (A)	
324-02-F0201	3"		04/24/81 (B)	N/A	YES
327-01-F0104	3"		07/17/81 (B)	N/A	YES
327-01-F0105	3"		05/25/81 (B)	N/A	NO
327-02-F0201	3"		10/06/81 (B)	N/A	NO
327-02-F0202	3"		12/04/80 (B)	N/A	YES
327-02-F0204	3"		01/29/81 (B)	N/A	YES
327-02-F0205	3"		02/25/81 (B)	N/A	YES
328-01-F0102	3"		05/05/81 (B)	N/A	YES

NOTE: An asterisk in the "WELD ID" column represents an addition to NHY's September 6, 1991 response (NYN 91142).

TABLE 3 - WELD RADIOGRAPH PACKAGES REVIEWED BY PH PRIOR TO 10/1/82

CVCS - PIPE TO TEE, ELBOW ETC. WELDS

WELD ID	SIZE	ADDRESSED IN NRC RPT	PH REVIEW DATE-(ORIGINAL TECHNIQUE)	PH REVIEW DATE IF RESHOT AND ACCEPTED AFTER 10/1/82 (TECHNIQUE)	[illegible] RED
328-01-F0103	3"		05/05/81 (B)	N/A	[illegible]
328-02-F0203	3"		01/22/81 (B)	N/A	[illegible]
328-02-F0205	3"		08/11/81 (B)	N/A	NO
328-03-F0301	2"		07/16/82 (B)	N/A	NO
332-02-F0202	2"		04/20/82 (B)	N/A	NO
355-01-F0101	3"		08/18/81 (B)	N/A	YES
355-01-F0113	3"	91-12**	02/01/82 (B)	N/A	
355-02-F0204	3"		05/18/81 (B)	N/A	YES
355-03-F0301*	3"		01/03/82 (B)	05/03/84 (A)	
355-03-F0304	3"	91-12	02/03/82 (B)	N/A	
355-04-F0404	3"		05/06/82 (B)	N/A	YES
355-05-F0501	3"	91-12	09/28/81 (B)	N/A	
355-06-F0602	3"		04/23/82 (B)	N/A	YES
355-06-F0603	3"		05/11/82 (B)	N/A	YES
355-07-F0703	3"	91-27	05/11/82 (B)	N/A	
355-09-F0905	3"	91-27	06/07/82 (B)	N/A	
355-09-F0906	3"		07/20/82 (B)	N/A	NO
356-01-F0104	3"		07/12/82 (B)	N/A	NO
356-01-F0105	3"		10/13/81 (B)	N/A	YES
360-03-F0301	3"		06/21/82 (B)	06/01/83 (A)	

NOTE 1: An asterisk in the "WELD ID" column represents an addition to NHY's September 6, 1991 response (NYN 91142).

NOTE 2: 357-05-F0504 was included in NHY's September 6, 1991 response but is deleted here [illegible] a 4" weld.

NOTE 3: A double asterisk represents a change to NHY's September 6, 1991 response (NYN [illegible]).

TABLE 3 - WELD RADIOGRAPH PACKAGES REVIEWED BY PH PRIOR TO 10/1/82

CVCS - PIPE TO TEE, ELBOW ETC. WELDS

WELD ID	SIZE	ADDRESSED IN NRC RPT	PH REVIEW DATE-(ORIGINAL TECHNIQUE)	PH REVIEW DATE IF RESHOT AND ACCEPTED AFTER 10/1/82 (TECHNIQUE)	WRRIP RESULTS RESHOT REQUIRED
360-03-F0303	3"	91-27	07/22/80 (B)	N/A	
360-04-F0401	3"	91-27	02/26/81 (B)	N/A	
360-04-F0402	3"		09/11/81 (B)	N/A	NO
360-07-F0702	3"		06/07/82 (B)	N/A	NO
360-12-F1201	3"		07/15/82 (B)	N/A	NO
363-01-F0103	2"		08/23/82 (B)	N/A	NO
363-01-F0106*	3"		08/23/82 (B)	08/02/84 (A)	
366-02-F0203	3"	NUREG 1425	08/13/82 (B)	09/28/84 (A)	
366-02-F0206	3"		07/08/82 (B)	04/30/84 (A)	
366-03-F0303*	3"		08/12/82 (B)	04/18/84 (A)	
368-02-F0201*	3"		08/12/82 (B)	10/26/84 (A)	
377-04-F0402*	3"		08/17/82 (B)	03/16/83 (A)	
378-01-F0102	3"		05/28/82 (B)	07/13/85 (A)	
392-01-F0101*	1"		06/22/82 (B)	07/24/84 (B)	
431-02-F0201*	3"		06/25/82 (B)	06/28/84 (A)	
432-03-F0303	3"		08/17/82 (B)	01/06/85 (A)	

NOTE 1: An asterisk in the "WELD ID" column represents an addition to NHY's September 6, 1991 response (NYN 91142).

NOTE 2: 366-02-F0205 was included on NHY's September 6, 1991 response (NYN 91142) but is deleted here since the initial PH review is 12/16/82.

TABLE 3 - WELD RADIOGRAPH PACKAGES REVIEWED BY PH PRIOR TO 10/1/82

CVCS - PIPE TO PIPE WELDS

WELD ID	SIZE	ADDRESSED IN NRC RPT	PH REVIEW DATE-(ORIGINAL TECHNIQUE)	PH REVIEW DATE IF RESHOT AND ACCEPTED AFTER 10/1/82 (TECHNIQUE)	WRRIP RESULTS RESHOT REQUIRED
302-01-F0102	3"	91-27	01/21/82 (B)	N/A	
302-01-F0104	3"	91-12	02/24/82 (B)	N/A	
302-03-F0305	3"	91-12	02/23/82 (B)	N/A	
303-03-F0302	3"		02/13/82 (B)	N/A	YES
303-04-F0405	3"		07/27/82 (B)	N/A	YES
318-04-F0402	3"		08/25/81 (B)	N/A	YES
324-02-F0203	3"		02/25/81 (B)	N/A	YES
327-01-F0102	3"		01/22/81 (B)	N/A	YES
327-01-F0103	3"		07/27/81 (B)	N/A	YES
327-02-F0203	3"		12/11/80 (B)	N/A	YES
327-02-F0210	3"		11/18/81 (B)	N/A	YES
327-02-F0211	3"		11/18/81 (B)	N/A	YES
328-01-F0101	3"		05/18/81 (B)	N/A	YES
328-02-F0201	3"		12/05/80 (B)	N/A	YES
355-01-F0111	3"		04/21/81 (B)	N/A	YES
355-02-F0202	3"	91-27	02/18/82 (B)	N/A	
355-02-F0203	3"		05/22/81 (B)	N/A	NO
355-03-F0303	3"		10/20/81 (B)	N/A	YES
355-05-F0502	3"		09/29/81 (B)	N/A	NO
355-05-F0503	3"		09/28/81 (B)	N/A	NO
355-06-F0601	3"	91-27	04/19/82 (B)	N/A	
355-08-F0809	3"		07/20/82 (B)	N/A	YES

TABLE 3 - WELD RADIOGRAPH PACKAGES REVIEWED BY PH PRIOR TO 10/1/82

CVCS - PIPE TO PIPE WELDS

WELD ID	SIZE	ADDRESSED IN NRC RPT	PH REVIEW DATE-(ORIGINAL TECHNIQUE)	PH REVIEW DATE IF RESHOT AND ACCEPTED AFTER 10/1/82 (TECHNIQUE)	WRRIP RESULTS RESHOT REQUIRED
355-09-F0901*	3"		08/23/82 (B)	04/17/84 (A)	
355-09-F0902	3"		07/21/82 (B)	N/A	YES
355-09-F0903	3"		06/16/82 (B)	N/A	YES
360-03-F0302	3"		05/15/80 (B)	N/A	NO
360-04-F0403	3"		07/17/81 (B)	N/A	YES
360-06-F0601*	3"		02/04/82 (B)	N/A	YES
360-07-F0701*	3"		06/07/82 (B)	10/24/84 (A)	
364-03-F0307	3"		07/24/82 (B)	N/A	YES
366-02-F0202*	3"		08/13/82 (B)	04/19/84 (A)	
366-02-F0204	3"	91-12	08/25/82 (B)	05/01/84 (A)	
378-03-F0303*	3"		04/24/82 (B)	07/13/84 (A)	
431-01-F0102*	3"		05/28/82 (B)	12/12/83 (A)	
432-01-F0102*	3"		07/02/82 (B)	07/06/84 (A)	
432-03-F0304	3"	91-12	08/17/82 (B)	07/02/84 (A)	

NOTE 1: An asterisk in the "WELD ID" column represents an addition to NHY's September 6, 1991 response (NYN 91142).

NOTE 2: 355-09-F0910 (BMR) was included in NHY's September 6, 1991 response (NYN 91142) but is deleted here since the initial PH review date was 2/11/83 and technique A was used.

NOTE 3: 1-CS-365-02-F0201 was included in NHY's September 6, 1991 response (NYN 91142) but was deleted here since the initial PH review date was 8/21/83.

NOTE 4: 1-CS-378-03-F0304 was included in NHY's September 6, 1991 response (NYN 91142) but was deleted here since the initial PH review date was 6/8/83 and Technique A was used.

TABLE 3 - WELD RADIOGRAPH PACKAGES REVIEWED BY PH PRIOR TO 10/1/82

RC - PIPE TO VALVE WELDS

WELD ID	SIZE	ADDRESSED IN NRC RPT	PH REVIEW DATE-(ORIGINAL TECHNIQUE)	PH REVIEW DATE IF RESHOT AND ACCEPTED AFTER 10/1/82 (TECHNIQUE)	WRRIP RESULTS - RESHOT REQUIRED
1-RC-97-01-F0105 (BMR)	3"	91-12	08/19/81 (B)	N/A	
1-RC-97-01-F0106 (BMR)	3"		08/19/81 (B)	N/A	NO
1-RC-97-03-F0301	3"		08/26/82 (B)	06/07/84 (A)	
1-RC-97-03-F0302*	3"		08/27/82 (B)	06/14/84 (A)	
1-RC-97-03-F0303*	3"		08/26/82 (B)	06/14/84 (A)	
1-RC-97-03-F0304	3"		09/27/82 (B)	06/14/84 (A)	NO

NOTE: An asterisk in the "WELD ID" column represents an addition to NHY's September 6, 1991 response (NYN 91142).

TABLE 3 - WELD RADIOGRAPH PACKAGES REVIEWED BY PH PRIOR TO 10/1/82

RC - PIPE TO PIPE WELDS

WELD ID	SIZE	ADDRESSED IN NRC RPT	PH REVIEW DATE-(ORIGINAL TECHNIQUE)	PH REVIEW DATE IF RESHOT AND ACCEPTED AFTER 10/1/82 (TECHNIQUE)	WRRIP RESULTS RESHOT REQUIRED
1-RC-97-02-F0204	3"		04/03/81 (B)	06/07/84 (A)	NO (REVIEWED BY C. HELLIER ASSOCIATES ONLY)
1-RC-97-03-F0309	3"		09/27/82 (B)	06/06/84 (A)	NO

TABLE 3 - WELD RADIOGRAPH PACKAGES REVIEWED BY PH PRIOR TO 10/1/82

RC - PIPE TO FITTING WELDS

WELD ID	SIZE	ADDRESSED IN NRC RPT	PH REVIEW DATE (ORIGINAL TECHNIQUE)	PH REVIEW DATE IF RESHOT AND ACCEPTED AFTER 10/1/82 (TECHNIQUE)	WRRIP RESULTS RESHOT REQUIRED
1-RC-97-02-F0205*	3"		08/27/82 (B)	06/07/84 (A)	

NOTE: An asterisk in the "WELD ID" column represents an addition to NHY's September 6, 1991 response (NYN 91142).

TABLE 3 - WELD RADIOGRAPH PACKAGES REVIEWED BY PH PRIOR TO 10/1/82

RH - PIPE TO FITTING WELDS

WELD ID	SIZE	ADDRESSED IN NRC RPT	PH REVIEW DATE-(ORIGINAL TECHNIQUE)	PH REVIEW DATE IF RESHOT AND ACCEPTED AFTER 10/1/82 (TECHNIQUE)	WRRIP RESULTS RESHOT REQUIRED
1-154-02-F0201	3"		06/01/81 (B)	06/12/85 (A)	

TABLE 3 - WELD RADIOGRAPH PACKAGES REVIEWED BY ** PRIOR TO 10/1/82

RMW - PIPE TO PIPE WELDS

WELD ID	SIZE	ADDRESSED IN NRC RPT	PH REVIEW DATE-(ORIGINAL TECHNIQUE)	PH REVIEW DATE IF RESHOT AND ACCEPTED AFTER 10/1/82 (TECHNIQUE)	WRRIP RESULTS RESHOT REQUIRED
1-1102-05-F0506	3"	91-27**	06/30/82 (B)	06/22/85 (A)	

NOTE: A double asterisk represents a change to NHY's September 6, 1991 response (NYN 91142).

TABLE 3 - WELD RADIOGRAPH PACKAGES REVIEWED BY PH PRIOR TO 10/1/82

RMW - PIPE TO PENETRATION WELDS

WELD ID	SIZE	ADDRESSED IN NRC RPT	PH REVIEW DATE-(ORIGINAL TECHNIQUE)	PH REVIEW DATE IF RESHOT AND ACCEPTED AFTER 10/1/82 (TECHNIQUE)	WRRIP RESULTS RESHOT REQUIRED
1-1102-05-F050*	3"		09/16/82 (B)	06/21/85 (A)	

NOTE: An asterisk in the "WELD ID" column represents an addition to NHY's September 6, 1991 response (NYN 91142).

TABLE 3 - WELD RADIOGRAPH PACKAGES REVIEWED BY PH PRIOR TO 10/1/82

SB - PIPE TO ELBOW, PIPE, OR VALVE WELDS

WELD ID	SIZE	ADDRESSED IN NRC RPT	PH REVIEW DATE-(ORIGINAL TECHNIQUE)	PH REVIEW DATE IF RESHOT AND ACCEPTED AFTER 10/1/82 (TECHNIQUE)	WRRIP RESULTS RESHOT REQUIRED
1-1304-01-F0101*	3"		09/16/82 (B)	08/02/84 (A)	
1-1304-01-F0102*	3"		08/26/82 (B)	08/02/84 (A)	
1-1304-01-F0103	3"		07/07/82 (B)	08/06/84 (A)	
1-1304-02-F0201	3"		03/07/82 (B)	N/A	YES
1-1304-03-F0303*	3"		09/28/82 (B)	08/08/84 (A)	
1-1304-04-F0401*	3"		06/14/82 (B)	08/03/84 (A)	
1-1304-04-F0402*	3"		06/14/82 (B)	08/03/84 (A)	
1-1307-05-F0502*	3"		06/14/82 (B)	08/03/84 (A)	
1-1307-06-F0602*	3"		06/18/82 (B)	08/06/84 (A)	
1-1307-07-F0701	3"		07/07/82 (B)	12/05/84 (A)	
1-1307-08-F0801	3"		02/19/82 (B)	08/02/84 (A)	

NOTE: An asterisk in the "WELD ID" column represents an addition to NHY's September 6, 1991 response (NYN 91142).

TABLE 3 - WELD RADIOGRAPH PACKAGES REVIEWED BY PH PRIOR TO 10/1/82

SB - PIPE TO PENETRATION WELDS

WELD ID	SIZE	ADDRESSED IN NRC RPT	PH REVIEW DATE-(ORIGINAL TECHNIQUE)	PH REVIEW DATE IF RESHOT AND ACCEPTED AFTER 10/1/82 (TECHNIQUE)	WRRIP RESULTS RESHOT REQUIRED
1-SB-1301-SL-X63-01-F0102*	2"		10/17/81 (B)	N/A	NO
1-SB-1304-SL-X64-01-F0102*	2"		10/17/81 (B)	N/A	NO
1-SB-1307-SL-X65-01-F0102*	2"		10/17/81 (B)	N/A	NO
1-SB-1310-SL-X66-01-F0102*	2"		10/17/81 (B)	N/A	NO

NOTE: An asterisk in the "WELD ID" column represents an addition to NHY's September 6, 1991 response (NYN 91142).

TABLE 3 - WELD RADIOGRAPH PACKAGES REVIEWED BY PH PRIOR TO 10/1/82

SI - PIPE TO VALVE WELDS

WELD ID	SIZE	ADDRESSED IN NRC PT	PH REVIEW DATE (ORIGINAL TECHNIQUE)	PH REVIEW DATE IF RESHOT AND ACCEPTED AFTER 10/1/82 (TECHNIQUE)	WRRIP RESULTS RESHOT REQUIRED
1-272-06-F0604*	3"		03/11/82 (B)	06/17/85 (A)	

NOTE: An asterisk in the "WELD ID" column represents an addition to NHY's September 6, 1991 response (NYN 91142).

TABLE 3 - WELD RADIOGRAPH PACKAGES REVIEWED BY PH PRIOR TO 10/1/82

WLD - PIPE TO VALVE WELDS

WELD ID	SIZE	ADDRESSED IN NRC RPT	PH REVIEW DATE-(ORIGINAL TECHNIQUE)	PH REVIEW DATE IF RESHOT AND ACCEPTED AFTER 10/1/82 (TECHNIQUE)	WRRIP RESULTS RESHOT REQUIRED
1-2102-17-F1705	3"		08/05/82 (B)	02/20/85 (A)	

TABLE 4

WELDS PREVIOUSLY REVIEWED BY THE NRC

WELD ID	SIZE	INITIAL P-H REVIEW	FINAL RADIOGRAPHIC TECHNIQUE	REFERENCE	NRC ACCEPT/ REJECT
1-CBS-1201-01-F0103	12"	12-27-79	A	NRC IR 91-12	ACCEPT
1-CBS-1201-04-F0401	14"	10-13-81	A	NRC IR 91-27	ACCEPT
1-CBS-1201-05-F0507	14"	12-22-81	A	NUREG-1425	ACCEPT
1-CBS-1201-07-F0702	14"	02-10-83	A	NRC IR 91-27	ACCEPT
1-CBS-1202-01-F0104	12"	12-27-79	A	NRC IR 91-27	ACCEPT
1-CBS-1202-01-F0101	12"	09-26-80	A	NRC IR 91-27	ACCEPT
1-CBS-1202-02-F0203	12"	11-06-80	A	NRC IR 91-27	ACCEPT
1-CBS-1202-04-F0404	14"	10-21-81	A	NRC IR 91-27	ACCEPT
1-CBS-1202-07-F0703	14"	10-27-81	A	NRC IR 91-27	ACCEPT
1-CBS-1202-07-F0706	14"	11-04-80	A	NRC IR 91-27	ACCEPT
1-CBS-1202-07-F0708	14"	11-04-80	A	NRC IR 82-06	ACCEPT
1-CBS-1203-03-F0305	8"	04-01-81	A	NRC IR 91-27	ACCEPT
1-CBS-1203-04-F0404	8"	06-25-81	A	NRC IR 91-27	ACCEPT
1-CBS-1204-02-F0203	8"	09-26-80	A	NRC IR 82-06	ACCEPT
1-CBS-1206-01-F0104	8"	12-17-81	A	NRC IR 82-06	ACCEPT
1-CBS-1206-01-F0105	8"	01-06-82	A	NRC IR 82-06	ACCEPT
1-CBS-1207-02-F0201	12"	06-02-81	A	NRC IR 91-27	ACCEPT
1-CBS-1208-01-F0104	12"	05-01-80	A	NRC IR 80-60	ACCEPT
1-CBS-1208-02-F0202	14"	05-15-80	A	NRC IR 80-60	ACCEPT
1-CBS-1211-02-F0204	16"	03-12-82	A	NRC IR 84-12, 84-06	ACCEPT
1-CBS-1212-02-F0206	16"	02-23-82	A	NRC IR 84-12, 84-06	ACCEPT

TABLE 4

WELDS PREVIOUSLY REVIEWED BY THE NRC

WELD ID	SIZE	INITIAL P-H REVIEW	FINAL RADIOGRAPHIC TECHNIQUE	REFERENCE	NRC ACCEPT/ REJECT
1-CBS-1214-01-F0101	14"	10-23-80	A	NRC IR 82-06	ACCEPT
1-CBS-1214-05-F0503	8"	10-25-83	A	NUREG-1425	ACCEPT
1-CBS-1214-05-F0512	8"	10-25-83	A	NUREG-1425	ACCEPT
1-CBS-1214-07-F0702	6"	07-22-80	A	NRC IR 91-27	ACCEPT
1-CBS-1216-04-F0403	8"	10-25-83	A	NUREG-1425	ACCEPT
1-CBS-1216-06-F0607	8"	10-31-83	A	NUREG-1425, IR 91-27	ACCEPT
1-CBS-1217-05-F0501	4"	03-16-84	A	NRC IR 91-27	ACCEPT
1-CBS-1222-07-F0706	4"	04-07-83	A	NRC IR 84-12, 84-06	ACCEPT
1-CBS-1224-02-F0202	6"	02-10-83	A	NRC IR 91-27	ACCEPT
1-CBS-1225-05-F0502	6"	01-16-81	A	NRC IR 91-27	ACCEPT
1-CBS-1225-07-F0702	6"	01-27-81	A	NRC IR 91-27	ACCEPT
1-CBS-1225-08-F0805	6"	10-25-83	A	NUREG-1425	ACCEPT
1-CC-752-03-F0302	12"	04-08-82	A	NRC IR 91-27	ACCEPT
1-CC-777-04-F0403	12"	03-09-82	A	NRC IR 91-27	ACCEPT
1-CC-817-F410705-F001	6"	11-19-84	A	NRC IR 91-27	ACCEPT
1-CC-817-F410705-F005	6"	11-02-84	A	NRC IR 91-27	ACCEPT
1-CC-817-F410705-F012	6"	02-27-84	A	NRC IR 85-19	ACCEPT
1-CC-821-F410704-F001	6"	04-05-84	A	NUREG-1425	ACCEPT
1-CC-821-F410704-F002	6"	04-09-84	A	NUREG-1425	ACCEPT
1-CC-821-F410704-F003	6"	11-21-84	A	NUREG-1425	ACCEPT
1-CC-821-F410704-F004	6"	12-03-84	A	NUREG-1425	ACCEPT

TABLE 4

WELDS PREVIOUSLY REVIEWED BY THE NRC

WELD ID	SIZE	INITIAL P-H REVIEW	FINAL RADIOGRAPHIC TECHNIQUE	REFERENCE	NRC ACCEPT/ REJECT
1-CC-821-F410704-F019	6"	04-09-84	A	NUREG-1425	ACCEPT
1-CS-302-01-F0102	3"	01-21-82	B	NRC IR 91-27	ACCEPT
1-CS-302-01-F0104	3"	02-24-82	B	NRC IR 91-12	ACCEPT
1-CS-302-02-F0209	3"	05-02-83	A	NRC IR 91-27	ACCEPT
1-CS-302-02-F0210	3"	07-01-83	A	NRC IR 91-27	ACCEPT
1-CS-302-03-F0302	3"	02-22-82	B	NRC IR 91-12	ACCEPT
1-CS-302-03-F0305	3"	02-23-82	B	NRC IR 91-12	ACCEPT
1-CS-302-04-F0403	3"	02-19-82	B	NRC IR 91-12	ACCEPT
1-CS-302-04-F0404	3"	02-22-82	B	NRC IR 91-12	REJECT
1-CS-303-03-F0301	3"	02-22-82	B	NRC IR 91-12	ACCEPT
1-CS-303-05-F0502	3"	02-16-82	B	NRC IR 91-12	ACCEPT
1-CS-303-05-F0503	3"	02-16-82	B	NRC IR 91-12	ACCEPT
1-CS-318-02-F0202	3"	10-30-81	B	NRC IR 91-12	REJECT
1-CS-318-02-F0204	2"	08-02-82	B	NRC IR 91-12	ACCEPT
1-CS-318-02-F0205	3"	09-12-81	B	NRC IR 91-27	REJECT
1-CS-328-08-F0818	2"	10-18-83	B	NRC IR 91-27	ACCEPT
1-CS-332-02-F0201	3"	04-11-84	A	NRC IR 91-27	ACCEPT
1-CS-355-01-F0102	3"	08-18-81	B	NRC IR 91-12	REJECT
1-CS-355-01-F0104	3"	04-15-81	B	NRC IR 91-12	ACCEPT
1-CS-355-01-F0109	3"	08-18-81	B	NRC IR 91-12	REJECT
1-CS-355-01-F0112	3"	07-03-81	B	NRC IR 91-27	ACCEPT

TABLE 4

WELDS PREVIOUSLY REVIEWED BY THE NRC

WELD ID	SIZE	INITIAL P-H REVIEW	FINAL RADIOGRAPHIC TECHNIQUE	REFERENCE	NRC ACCEPT/ REJECT
1-CS-355-01-F0113	3"	02-01-82	B	NRC IR 91-12	ACCEPT
1-CS-355-02-F0202	3"	02-18-82	B	NRC IR 91-27	ACCEPT
1-CS-355-03-F0304	3"	02-03-82	B	NRC IR 91-12	ACCEPT
1-CS-355-05-F0501	3"	09-28-81	B	NRC IR 91-12	REJECT
1-CS-355-06-F0601	3"	04-19-82	B	NRC IR 91-27	ACCEPT
1-CS-355-07-F0703	3"	05-11-82	B	NRC IR 91-27	ACCEPT
1-CS-355-08-F0801	3"	07-20-82	B	NRC IR 91-12	REJECT
1-CS-355-09-F0905	3"	06-07-82	B	NRC IR 91-27	ACCEPT
1-CS-355-12-F1203	3"	06-07-83	A	NRC IR 91-12	ACCEPT
1-CS-356-01-F0102	3"	08-27-81	B	NRC IR 91-12	ACCEPT
1-CS-357-01-F0103	4"	01-13-82	A	NRC IR 91-27	ACCEPT
1-CS-357-03-F0305	4"	08-25-81	A	NRC IR 91-12	ACCEPT
1-CS-357-04-F0406	4"	10-03-84	A	NUREG-1425	ACCEPT
1-CS-358-05-F0502	3"	01-22-85	A	NRC IR 91-27	ACCEPT
1-CS-360-01-F0102	3"	01-09-85	A	NRC IR 91-27	ACCEPT
1-CS-360-02-F0204	3"	12-10-84	A	NRC IR 91-12	ACCEPT
1-CS-360-02-F0205	3"	06-03-82	B	NRC IR 91-27	ACCEPT
1-CS-360-02-F0206	3"	05-27-82	A	NRC IR 91-12	ACCEPT
1-CS-360-03-F0303	3"	07-22-80	B	NRC IR 91-27	ACCEPT
1-CS-360-04-F0401	3"	02-26-81	B	NRC IR 91-27	ACCEPT
1-CS-360-07-F0703	4"	05-24-82	A	NRC IR 91-27	ACCEPT

TABLE 4

WELDS PREVIOUSLY REVIEWED BY THE NRC

WELD ID	SIZE	INITIAL P-H REVIEW	FINAL RADIOGRAPHIC TECHNIQUE	REFERENCE	NRC ACCEPT/ REJECT
1-CS-360-08-F0805	4"	11-17-81	A	NRC IR 85-19	ACCEPT
1-CS-364-02-F0205	4"	02-08-84	A	NRC IR 91-27	ACCEPT
1-CS-364-03-F0301	3"	07-24-82	A	NUREG-1425	ACCEPT
1-CS-364-03-F0305	3"	05-04-81	B	NRC IR 91-27	ACCEPT
1-CS-365-01-F0101	2"	03-22-83	A	NUREG-1425	ACCEPT
1-CS-365-01-F0111	2"	11-07-83	A	NUREG-1425	ACCEPT
1-CS-366-02-F0203	3"	08-13-82	A	NUREG-1425	ACCEPT
1-CS-366-02-F0204	3"	08-25-82	A	NRC IR 91-12	ACCEPT
1-CS-366-05-F0502	3"	04-05-83	A	NRC IR 91-27	ACCEPT
1-CS-369-01-F0101	6"	03-13-80	A	NRC IR 91-27	ACCEPT
1-CS-369-08-F0804	8"	09-15-81	A	NRC IR 91-27	ACCEPT
1-CS-369-10-F1008	8"	09-14-82	A	NRC IR 91-27	ACCEPT
1-CS-369-10-F1009	8"	09-14-82	A	NRC IR 91-27	ACCEPT
1-CS-369-10-F1001	8"	11-20-80	A	NRC IR 91-27	ACCEPT
1-CS-369-10-F1002	8"	12-11-80	A	NRC IR 91-27	ACCEPT
1-CS-374-F410303-F003	4"	03-06-84	A	NRC IR 91-27	ACCEPT
1-CS-375-01-F0115	3"	01-16-84	A	NRC IR 91-27	ACCEPT
1-CS-377-01-F0103	3"	01-16-84	A	NUREG-1425	ACCEPT
1-CS-388-06-F0602	3"	10-27-82	A	NRC IR 91-27	ACCEPT
1-CS-416-F410310-F036	3"	11-14-84	A	NRC IR 91-27	ACCEPT
1-CS-431-02-F0203	3"	07-15-85	A	NUREG-1425	ACCEPT

TABLE 4

WELDS PREVIOUSLY REVIEWED BY THE NRC

WELD ID	SIZE	INITIAL P-H REVIEW	FINAL RADIOGRAPHIC TECHNIQUE	REFERENCE	NRC ACCEPT/ REJECT
1-CS-432-02-F0203	3"	07-18-85	A	NRC IR 91-12	ACCEPT
1-CS-432-03-F0301	4"	01-28-83	A	NUREG-1425	ACCEPT
1-CS-432-03-F0304	3"	08-17-82	A	NRC IR 91-12	ACCEPT
1-CS-453-02-F0205	4"	03-11-82	A	NRC IR 91-27	ACCEPT
1-CS-499-03-F0314	3"	08-16-89*	A	NRC IR 91-27	ACCEPT
1-CS-499-06-F0603	3"	07-14-85	A	NRC IR 91-27	ACCEPT
1-CS-523-01-F0101	3"	07-15-85	A	NUREG-1425	ACCEPT
1-CS-523-02-F0203	3"	05-18-83	A	NRC IR 91-27	ACCEPT
1-CS-523-02-F0204	3"	07-30-85	A	NRC IR 91-27	ACCEPT
1-DG-4351-01-F0101	26"	09-12-83	C	NUREG-1425	REJECT
1-DG-4351-01-F0102	26"	03-12-85	A	NUREG-1425	ACCEPT
1-DG-4351-01-F0103	26"	09-12-83	C	NUREG-1425	ACCEPT
1-DG-4355-01-F0113	12"	09-12-83	A	NUREG-1425	ACCEPT
1-DG-4363-01-F0101	40"	09-19-83	A	NUREG-1425	ACCEPT
1-DG-4363-01-F0102	40"	09-21-83	C	NUREG-1425	ACCEPT
1-DG-4363-01-F0112	12"	10-13-85	A	NUREG-1425	ACCEPT
1-FW-4600-01-F0118	24"	08-31-81	C	NRC IR 91-27	ACCEPT
1-FW 4600-06-F0602	24"	02-28-81	C	NUREG-1425	ACCEPT
1-FW-4601-04-F0402	24"	05-24-82	C	NRC IR 91-27	ACCEPT
1-FW-4601-06-F0603	24"	03-22-85	C	NRC IR 91-27	ACCEPT

*Performed by NQS

TABLE 4

WELDS PREVIOUSLY REVIEWED BY THE NRC

WELD ID	SIZE	INITIAL P-H REVIEW	FINAL RADIOGRAPHIC TECHNIQUE	REFERENCE	NRC ACCEPT/ REJECT
1-FW-4606-10-F1002	18"	07-12-85	A	NUREG-1425	ACCEPT
1-FW-4606-16-F1609	4"	02-25-85	A	NRC IR 91-27	ACCEPT
1-FW-4607-01-F0101	16"	06-10-82	C	NRC IR 91-27	ACCEPT
1-FW-4607-03-F0309	16"	02-09-83	C	NUREG-1425	ACCEPT
1-FW-4607-09-F0903	18"	10-05-82	A	NRC IR 91-27	ACCEPT
1-FW-4607-17-F1704	4"	09-29-83	A	NUREG-1425, IR 91-27	ACCEPT
1-FW-4608-01-F0101	16"	03-09-82	A	NRC IR 85-31	ACCEPT
1-FW-4608-01-F0102	16"	06-07-82	C	NRC IR 85-31	ACCEPT
1-FW-4606-11-F1102	18"	10-31-84	A	NUREG-1425	ACCEPT
1-FW-4608-13-F1302	18"	01-23-85	A	NUREG-1425	ACCEPT
1-FW-4609-01-F0116	16"	08-24-82	D	NRC IR 91-27	ACCEPT
1-FW-4609-03-F0305	16"	12-21-84	A	NUREG-1425	ACCEPT
1-FW-4609-06-F0601	16"	10-03-81	C	NRC IR 91-27	ACCEPT
1-FW-4609-18-F1802	4"	05-09-83	A	NRC IR 85-19	ACCEPT
1-FW-4609-19-F1901	4"	07-05-83	A	NRC IR 85-19	ACCEPT
1-FW-4617-01-F0101	4"	09-22-82	A	NUREG-1425	ACCEPT
1-MS-4000-05-F0501	6"	11-19-82	A	NRC IR 85-19	ACCEPT
1-MS-4000-05-F0502	6"	11-04-82	A	NRC IR 85-19	ACCEPT
1-MS-4000-06-F0602	30"	04-29-82	C	NRC IR 91-27	ACCEPT
1-MS-4001-01-F0102	30"	08-26-82	C	NUREG-1425	ACCEPT
1-MS-4001-04-F0402	6"	05-19-83	A	NRC IR 91-27	ACCEPT

TABLE 4

WELDS PREVIOUSLY REVIEWED BY THE NRC

WELD ID	SIZE	INITIAL P-H REVIEW	FINAL RADIOGRAPHIC TECHNIQUE	REFERENCE	NRC ACCEPT/ REJECT
1-MS-4001-09-F0904	30"	01-04-83	A	NRC IR 91-27	ACCEPT
1-MS-4001-10-F1007	6"	05-19-83	A	NRC IR 91-27	ACCEPT
1-MS-4003-10-F1003	30"	09-30-82	A	NUREG-1425	ACCEPT
1-MS-4005-03-F0306	24"	06-07-82	C	NUREG-1425	ACCEPT
1-MS-4007-01-F0106	30"	08-16-82	C	NUREG-1425	ACCEPT
1-MS-4009-01-F0109	30"	07-28-82	C	NUREG-1425	ACCEPT
1-MS-4010-05-F0504	24"	10-22-81	C	NRC IR 91-27	ACCEPT
1-RC-1-01-F0101	31"	11-08-83	C	NRC IR 83-19	ACCEPT
1-RC-2-01-F0101	31"	04-05-83	C	NUREG-1425, IR 82-06	ACCEPT
1-RC-2-01-F0102	31"	03-22-83	C	NUREG-1425, IR 82-06	ACCEPT
1-RC-2-01-F0103	31"	03-23-83	C	NUREG-1425, IR 82-06	ACCEPT
1-RC-2-01-F0104	31"	03-31-83	C	NRC IR 83-19	ACCEPT
1-RC-3-01-F0101	27.5"	11-01-83	C	NUREG-1425	ACCEPT
1-RC-3-01-F0102	27.5"	10-11-83	C	NUREG-1425	ACCEPT
1-RC-4-01-F0101	31"	10-12-83	C	NUREG-1425, IR 83-19	ACCEPT
1-RC-5-01-F0101	31"	04-19-83	C	NUREG-1425, IR 82-06	ACCEPT
1-RC-5-01-F0102	31"	04-11-83	C	NUREG-1425, IR 82-06	ACCEPT
1-RC-5-01-F0103	31"	05-31-83	C	NUREG-1425, IR 82-06	ACCEPT
1-RC-5-01-F0104	31"	05-17-83	C	NRC IR 83-19	ACCEPT
1-RC-6-01-F0101	27.5"	11-01-83	C	NUREG-1425	ACCEPT
1-RC-6-01-F0102	27.5"	12-30-82	C	NUREG-1425	ACCEPT

TABLE 4

WELDS PREVIOUSLY REVIEWED BY THE NRC

WELD ID	SIZE	INITIAL P-H REVIEW	FINAL RADIOGRAPHIC TECHNIQUE	REFERENCE	NRC ACCEPT/ REJECT
1-RC-7-01-F0101	31"	11-10-83	C	NUREG-1425, IR 83-19	REJECT
1-RC-7-01-F0102	29"	11-15-83	C	NUREG-1425	ACCEPT
1-RC-8-01-F0101	31"	11-03-83	C	NUREG-1425, IR 82-06	ACCEPT
1-RC-8-01-F0102	31"	07-30-83	C	NUREG-1425, IR 82-06	ACCEPT
1-RC-8-01-F0103	31"	07-31-83	C	NUREG-1425, IR 82-06	ACCEPT
1-RC-8-01-F0104	31"	08-03-83	C	NRC IR 83-19	ACCEPT
1-RC-9-01-F0102	27.5"	12-09-83	C	NUREG-1425	ACCEPT
1-RC-10-01-F0101	31"	11-08-83	C	NUREG-1425	ACCEPT
1-RC-10-01-F0102	31"	01-31-84	C	NUREG-1425	ACCEPT
1-RC-11-01-F0101	31"	12-03-82	C	NUREG-1425, IR 83-19	REJECT
1-RC-11-02-F0102	31"	11-03-83	C	NUREG-1425, IR 82-06	ACCEPT
1-RC-11-01-F0103	31"	11-05-83	C	NUREG-1425, IR 82-06	ACCEPT
1-RC-11-01-F0104	31"	11-05-83	C	NUREG-1425, IR 82-06	ACCEPT
1-RC-13-02-F0202	12"	02-04-81	A	NUREG-1425	ACCEPT
1-RC-13-02-F0203	12"	04-14-81	A	NRC IR 91-12	ACCEPT
1-RC-13-03-F0304	12"	08-11-89	A	NRC IR 84-12, 84-06	ACCEPT
1-RC-13-04-F0401	12"	04-12-82	A	NRC IR 91-27	ACCEPT
1-RC-13-04-F0403	12"	02-17-82	A	NUREG-1425, IR 91-27	ACCEPT
1-RC-13-06-F0605	12"	03-04-83	A	NRC IR 85-19	ACCEPT
1-RC-13-07-F0702	12"	05-16-83	A	NUREG-1425	ACCEPT
1-RC-13-07-F0704	12"	09-29-82	A	NUREG-1425	ACCEPT

TABLE 4

WELDS PREVIOUSLY REVIEWED BY THE NRC

WELD ID	SIZE	INITIAL P-H REVIEW	FINAL RADIOGRAPHIC TECHNIQUE	REFERENCE	NRC ACCEPT/ REJECT
1-RC-15-04-F0403	2"	02-27-84	A	NUREG-1425	ACCEPT
1-RC-15-05-F0502	2"	04-04-84	A	NRC IR 91-27	ACCEPT
1-RC-15-05-F0504	3"	02-11-84	A	NUREG-1425	ACCEPT
1-RC-21-02-F0201	4"	10-19-82	A	NRC IR 91-12	ACCEPT
1-RC-30-01-F0101	3"	03-22-84	A	NUREG-1425	ACCEPT
1-RC-30-01-F0103	3"	11-22-82	A	NUREG-1425	ACCEPT
1-RC-30-03-F0303	3"	08-31-83	A	NUREG-1425	ACCEPT
1-RC-30-07-F0705	2"	04-09-84	A	NRC IR 91-27	ACCEPT
1-RC-30-04-F0401	2"	03-29-84	A	NRC IR 91-27	ACCEPT
1-RC-33-04-F0401	2"	06-05-84	A	NUREG-1425, IR 91-27	ACCEPT
1-RC-44-05-F0501	3"	02-06-84	A	NUREG-1425	ACCEPT
1-RC-45-01-F0107	2"	10-31-83	B	NUREG-1425	ACCEPT
1-RC-48-01-F0101	4"	09-10-84	A	NRC IR 91-27	ACCEPT
1-RC-48-04-F0401	4"	04-06-83	A	NRC IR 85-19	ACCEPT
1-RC-48-04-F0402	4"	04-06-83	A	NRC IR 85-19	ACCEPT
1-RC-49-01-F0101	14"	05-18-82	A	NUREG-1425	ACCEPT
1-RC-49-01-F0102	14"	10-28-82	A	NUREG-1425	ACCEPT
1-RC-49-01-F0103	14"	12-30-83	A	NUREG-1425, IR 85-19	ACCEPT
1-RC-58-01-F0106	12"	06-26-80	C	NRC IR 91-27	ACCEPT
1-RC-58-01-F0101	16"	07-21-80	A	NRC IR 82-06	ACCEPT
1-RC-58-03-F0301	12"	04-20-83	A	NRC IR 84-06, 84-12	ACCEPT

TABLE 4

WELDS PREVIOUSLY REVIEWED BY THE NRC

WELD ID	SIZE	INITIAL P-H REVIEW	FINAL RADIOGRAPHIC TECHNIQUE	REFERENCE	NRC ACCEPT/ REJECT
1-RC-58-03-F0302	12"	08-11-82	A	NRC IR 84-12, 84-06	ACCEPT
1-RC-59-04-F0405	3"	02-06-84	A	NUREG-1425	ACCEPT
1-RC-59-05-F0502	3"	11-08-83	A	NUREG-1425	ACCEPT
1-RC-59-06-F0602	3"	10-17-83	A	NUREG-1425	ACCEPT
1-RC-62-01-F0106	2"	02-06-84	A	NUREG-1425	ACCEPT
1-RC-74-F410001-F012	6"	01-09-84	A	NUREG-1425	ACCEPT
1-RC-91-F410005-F002	3"	10-19-84	B	NUREG-1425	ACCEPT
1-RC-91-F410005-F005	3"	10-03-84	B	NUREG-1425	ACCEPT
1-RC-96-F410018-F001	2"	02-16-84	A	NUREG-1425	ACCEPT
1-RC-96-F410018-F004	2"	02-07-84	A	NUREG-1425	ACCEPT
1-RC-97-01-F0105	3"	08-19-81	B	NRC IR 91-12	ACCEPT
1-RC-97-02-F0203	3"	07-01-85	A	NUREG-1425	ACCEPT
1-RC-98-F410014-F006	2"	02-21-84	A	NRC IR 91-12	ACCEPT
1-RH-151-01-F0102	8"	01-07-80	A	NRC IR 91-12	ACCEPT
1-RH-152-01-F0102	8"	08-12-83	A	NUREG-1425	ACCEPT
1-RH-155-06-F0601	8"	09-16-81	A	NRC IR 85-19	ACCEPT
1-RH-155-06-F0604	6"	10-26-81	A	NRC IR 91-27	ACCEPT
1-RH-155-06-F0605	6"	11-03-83	A	NUREG-1425, IR 85-19	ACCEPT
1-RH-155-06-F0606	6"	11-03-83	A	NRC IR 85-19	ACCEPT
1-RH-155-06-F0608	8"	11-07-83	A	NUREG-1425, IR 91-27	ACCEPT
1-RH-157-01-F0119	8"	04-29-82	A	NRC IR 91-27	ACCEPT

TABLE 4

WELDS PREVIOUSLY REVIEWED BY THE NRC

WELD ID	SIZE	INITIAL P-H REVIEW	FINAL RADIOGRAPHIC TECHNIQUE	REFERENCE	NRC ACCEPT/ REJECT
1-RH-157-02-F0203	8"	11-06-80	A	NRC IR 91-27	ACCEPT
1-RH-158-01-F0101	12"	10-20-81	A	NUREG-1425	ACCEPT
1-RH-158-03-F0301	8"	10-06-81	A	NRC IR 85-19	ACCEPT
1-RH-158-04-F0402	8"	08-19-81	A	NRC IR 91-27	ACCEPT
1-RH-158-04-F0406	8"	08-08-83	A	NUREG-1425	ACCEPT
1-RH-158-04-F0408	8"	08-08-83	A	NUREG-1425	ACCEPT
1-RH-158-04-F0411	6"	11-07-83	A	NUREG-1425	ACCEPT
1-RH-158-07-F0703	6"	01-11-82	A	NRC IR 91-27	ACCEPT
1-RH-158-08-F0803	6"	08-30-83	A	NUREG-1425	ACCEPT
1-RH-159-02-F0202	8"	04-30-82	A	NRC IR 91-27	ACCEPT
1-RH-160-02-F0203	8"	10-03-80	A	NRC IR 91-27	ACCEPT
1-RH-160-04-F0408	12"	12-05-83	A	NRC IR 85-19	ACCEPT
1-RH-160-05-F0503	8"	09-11-81	A	NRC IR 91-27	ACCEPT
1-RH-161-01-F0101	8"	02-23-81	A	NRC IR 91-27	ACCEPT
1-RH-162-01-F0109	6"	06-03-86	A	NRC IR 85-19	ACCEPT
1-RH-179-02-F0202	8"	10-20-81	A	NRC IR 91-27	ACCEPT
1-RMW-1102-05-F0506	3"	06-30-82	A	NRC IR 91-27	ACCEPT
1-SB-1307-02-F0206	3"	01-24-84	A	NUREG-1425	ACCEPT
1-SB-1307-15-F1503	2"	07-15-83	A	NUREG-1425	ACCEPT
1-SB-1310-05-F0521	3"	02-08-85	A	NRC IR 91-27	ACCEPT
1-SB-1310-06-F0605	3"	11-08-83	A	NUREG-1425	ACCEPT

TABLE 4

WELDS PREVIOUSLY REVIEWED BY THE NRC

WELD ID	SIZE	INITIAL P-H REVIEW	FINAL RADIOGRAPHIC TECHNIQUE	REFERENCE	NRC ACCEPT/ REJECT
1-SB-1310-14-F1401	2"	02-22-85	A	NRC IR 91-27	ACCEPT
1-SB-1310-SL-V66-01-F0101	8"	10-26-82	C	NUREG-1425	ACCEPT
1-SI-201-02-F0201	10"	07-25-83	A	NRC IR 85-19	ACCEPT
1-SI-201-02-F0208	10"	02-04-83	A	NUREG-1425, IR 91-27	ACCEPT
1-SI-202-02-F0205	10"	06-08-81	A	NRC IR 91-27	ACCEPT
1-SI-204-02-F0202	10"	12-29-82	A	NRC IR 82-06	REJECT
1-SI-204-02-F0205	10"	08-27 34	A	NUREG-1425	ACCEPT
1-SI-250-04-F0402	4"	01-28-82	A	NRC IR 91-27	ACCEPT
1-SI-250-05-F0501	4"	05-06-82	A	NRC IR 91-27	ACCEPT
1-SI-251-11-F1107	2"	02-12-85	B	NRC IR 85-19	ACCEPT
1-SI-256-01-F0107	4"	08-27-82	A	NUREG-1425	ACCEPT
1-SI-256-04-F0411	2"	01-30-84	A	NUREG-1425	ACCEPT
1-SI-256-06-F0601	4"	12-04-81	A	NRC IR 91-27	ACCEPT
1-SI-257-01-F0103	4"	10-20-81	A	NRC IR 91-27	ACCEPT
1-SI-257-01-F0104	4"	06-17-82	A	NUREG-1425	ACCEPT
1-SI-261-04-F0402	6"	07-27-82	A	NUREG-1425	ACCEPT
1-SI-273-02-F0203	1.5"	08-24-84	B	NUREG-1425	ACCEPT
1-SI-275-01-F0104	1.5"	12-21-84	B	NUREG-1425	ACCEPT

ATTACHMENT B

HELLIER

REPORT # 919 - 12F Rev 1

PREPARED FOR NEW HAMPSHIRE YANKEE

SEABROOK, NEW HAMPSHIRE

PREPARED BY Charles K Hellier
Charles J. Hellier

DATE Sept 16, 1991

EXECUTIVE SUMMARY

HELLIER was contracted by New Hampshire Yankee to provide an independent and unbiased review of one hundred (100) weld radiographs taken by Pullman-Higgins prior to October 1, 1982 of three inch nominal pipe size and smaller. The radiographs were taken with the double wall exposure, double wall viewing technique which is in compliance with the ASME Code, Section V. The inherent difficulties with this technique requires precise set up and exposure in order to achieve required radiographic density coverage.

Of the 100, forty-four (44) were found not to be in compliance with the ASME Code requirements due to inadequate coverage based on code density requirements and three (3) due to unacceptable quality levels (essential penetrameter hole not visible).

CONCLUSION

Based on the results of this review, it can be concluded that the technique used for some of the radiographs for under 3 1/2" diameter pipe welds prior to October 1, 1982 was not properly applied to achieve all film density criteria necessary to strictly comply with each of the applicable Code requirements. The film quality was sufficient to allow HELLIER to conclude that there were no apparent physical weld concerns in the welds reviewed.

RECOMMENDATION

It is recommended that the welds which are not in compliance with the ASME Code requirements regarding density or film quality level be re-radiographed until compliance is achieved.

Introduction

HELLIER has been engaged by New Hampshire Yankee for the purpose of providing an independent Code compliance review of a number of field weld radiographs evaluated and approved by Pullman-Higgins personnel prior to October 1, 1982. These welds are 3" nominal pipe size and smaller and were originally radiographed using the double wall exposure, double wall viewing technique.

Personnel

HELLIER personnel involved with this review included Charles J. Hellier, President, Kenneth Coryell, Vice President, and Michael McLean, Senior Level III. All personnel carry HELLIER Level III Certifications and hold American Society for Nondestructive Testing Level III Certificates in Radiography. Documentation to support the certifications has been given to New Hampshire Yankee.

Review

All radiographs were reviewed to ASME Section V and Section III, 1977 Edition and Pullman-Higgins Procedure IX-RT-1-W77; and New Hampshire Yankee Procedure 11230, Rev O dated 8/28/91 (Level III Review of Radiographic Film). While each radiograph was reviewed for total Code compliance, emphasis was placed on weld coverage and film quality level. Weld coverage is primarily a function of density achieved through the area of interest.

The base density is established by taking a density reading through the penetrameter. Density readings in the area of interest (AOI) cannot vary by greater than +30%, -15% from the base density established through the penetrameter. The Code further stipulates that the minimum density for each film (single film viewing) cannot be less than 2.0 or 1.3 (composite film viewing). The maximum density considered acceptable for evaluation by the Code is 4.0 (single or composite viewing).

When pipe welds with relatively small diameters are radiographed using the double wall exposure and double wall view technique, (either elliptical or superimposed image) the effective composite through wall path the radiation passes through, radically changes as the distance away from the pipe center increases. (See Figure # 1).

If a typical radiographic technique produces an image with good contrast (beneficial in radiography in order to observe density changes resulting from small cross sectional thickness changes), the density variations as a result of this effective composite through wall path will be significant.

If a low contrast radiograph is taken, the result will be a more uniform density throughout the area of interest thereby minimizing the possibility of falling outside the code-required density range.

To summarize, the lower contrast technique resulting in greater coverage does not provide the best quality image for interpretation.

This rational is not intended to provide an excuse for not complying with the Code but merely to point out the reason for the density variation problems. Increasing the number of exposures to achieve greater coverage would have been one solution.

Results

The results of this review are contained in Enclosure # 1. The categories are (1) Acceptable, (2) Inadequate coverage due to density variations either outside the -15% minimum or less than the 2.0 required, and (3) Unacceptable due to film quality level not being achieved. The review did not disclose any apparent concerns regarding weld quality. Subsequent reports will address the in-process re-radiographic results.

Recommendations

Re-radiograph those welds considered unacceptable to achieve compliance with Code requirements regarding radiographic technique and coverage.

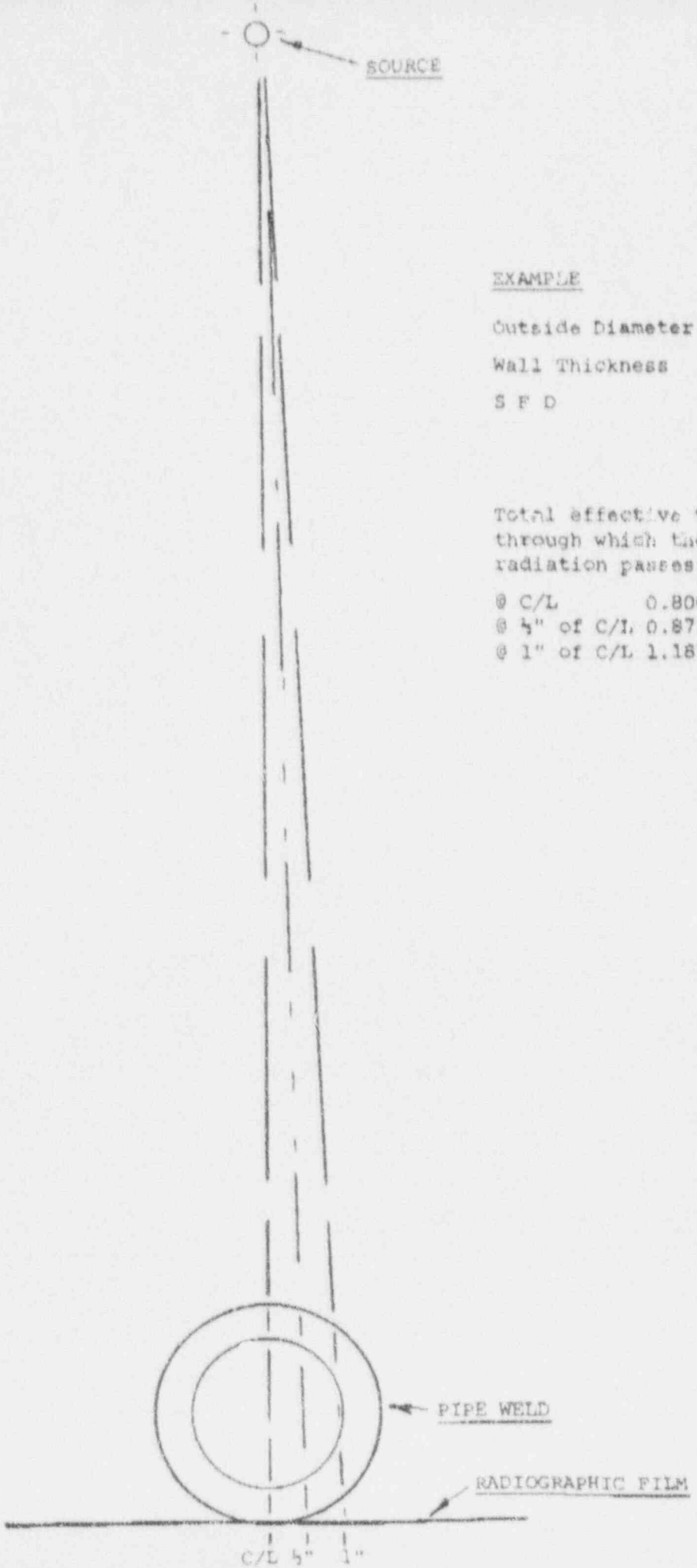
ENCLOSURE # 1

Accept	Inadequate Density	Unacceptable Film Quality
1-CS-302-04-F0402		
1-CS-302-01-F0103		
1-CS-302-03-F0301		
1-CS-301-06-F0602		
1-CS-303-05-F0504		
1-CS-303-05-F0503		
1-CS-303-05-F0502		
1-CS-303-03-F0303		
1-CS-302-04-F0403		
1-CS-301-06-F0601		
1-CS-327-02-F0201		
	1-CS-327-02-F0210	
1-CS-328-01-F0103		
1-CS-303-05-F0505		
1-CS-318-01-F0101		
1-CS-318-04-F0404		
	1-CS-327-01-F0103	
1-CS-327-01-F0105		
	1-CS-318-04-F0402	
	1-CS-327-01-F0102	
1-CS-328-03-F0301		
1-CS-332-02-F0202		
1-CS-340-01-F0104		
1-CS-328-02-F0205		
	1-CS-303-04 F0405	
	1-CS-327-02-F0203	1-CS-327-02-F0203
	1-CS-324-02-F0203	
	1-CS-327-02-F0211	
	1-CS-328-01-F0101	
1-CS-340-01-F0105		
	1-CS-355-01-F0108	
	1-CS-355-01-F0111	
1-CS-355-02-F0203		
	1-CS-355-02-F0204	
	1-CS-355-03-F0303	
	1-CS-303-03-F0302	
	1-CS-355-01-F0101	
1-CS-355-01-F0103		
	1-CS-355-01-F0106	
	1-CS-355-01-F0105	
	1-CS-355-01-F0107	
	1-CS-355-04-F0404	
1-CS-355-04-F0403		
	1-CS-355-04-F0402	
	1-CS-355-04-F0401	
1-CS-355-05-F0502		
1-CS-355-05-F0503		
1-CS-356-01-F0104		
1-CS-355-09-F0906		
	1-CS-355-09-F0903	

Accept	Inadequate Density	Unacceptable Film Quality
1-CS-355-08-F0802	1-CS-355-06-F0603	
	1-CS-355-08-F0805	
	1-CS-355-09-F0902	
	1-CS-355-06-F0602	
		1-CS-356-01-F0105
1-CS-357-05-F0504	1-CS-360-01-F0101	
		1-CS-360-02-F0201
1-CS-360-03-F0302		
1-CS-360-04-F0402		
	1-CS-360-04-F0403	
1-CS-360-07-F0702		
	1-CS-360-05-F0504	
1-CS-360-09-F0901		
1-CS-364-03-F0303		
		1-CS-364-03-F0306
1-CS-364-03-F0304		
1-RC-97-01-F0106		
1-CS-365-02-F0201		
1-CS-366-02-F0205		
1-RC-97-03-F0304		
1-RC-97-03-F0309		
1-RC-97-02-F0204		
1-CS-363-01-F0103		
	1-CS-360-11-F1102	
	1-CS-364-03-F0302	
	1-SB-1304-02-F0201	1-SB- 1304-02-F0201
1-CS-360-11-F1101		
1-CS-360-12-F1202		
1-CS-360-12-F1201		
	1-CS-364-03-F0307	
1-CS-360-09-F0902		
	1-CS-318-01-F0103	
	1-CS-318-04-F0403	
1-CS-303-04-F0401		
1-CS-303-05-F0501		
	1-CS-324-02-F0201	1-CS-324-02-F0201
	1-CS-327-01-F0104	
	1-CS-327-02-F0202	
	1-CS-327-02-F0204	
	1-CS-327-02-F0205	
	1-CS-328-01-F0102	1-CS-328-01-F0102
	1-CS-328-02-F0203	
	1-CS-328-02-F0201	

An additional five (5) welds have been reviewed by Mike McLean. They are listed below with his disposition:

1-SL-X-6301-F0102	Acceptable
1-SL-X-6401-F0102	Acceptable
1-SL-X-6501-F0102	Acceptable
1-SL-X-6601-F0102	Acceptable
1-CS-360-06-F0601	Unacceptable due to inadequate coverage due to density.



EXAMPLE

Outside Diameter	2.0"
Wall Thickness	0.4"
S F D	20.0"

Total effective thickness through which the radiation passes:

@ C/L	0.800"
@ ½" of C/L	0.875"
@ 1" of C/L	1.187"

FIGURE #1