Figure A5-41 Scotch 77 Fire Retardant Tape Test 1 Post-Test Picture

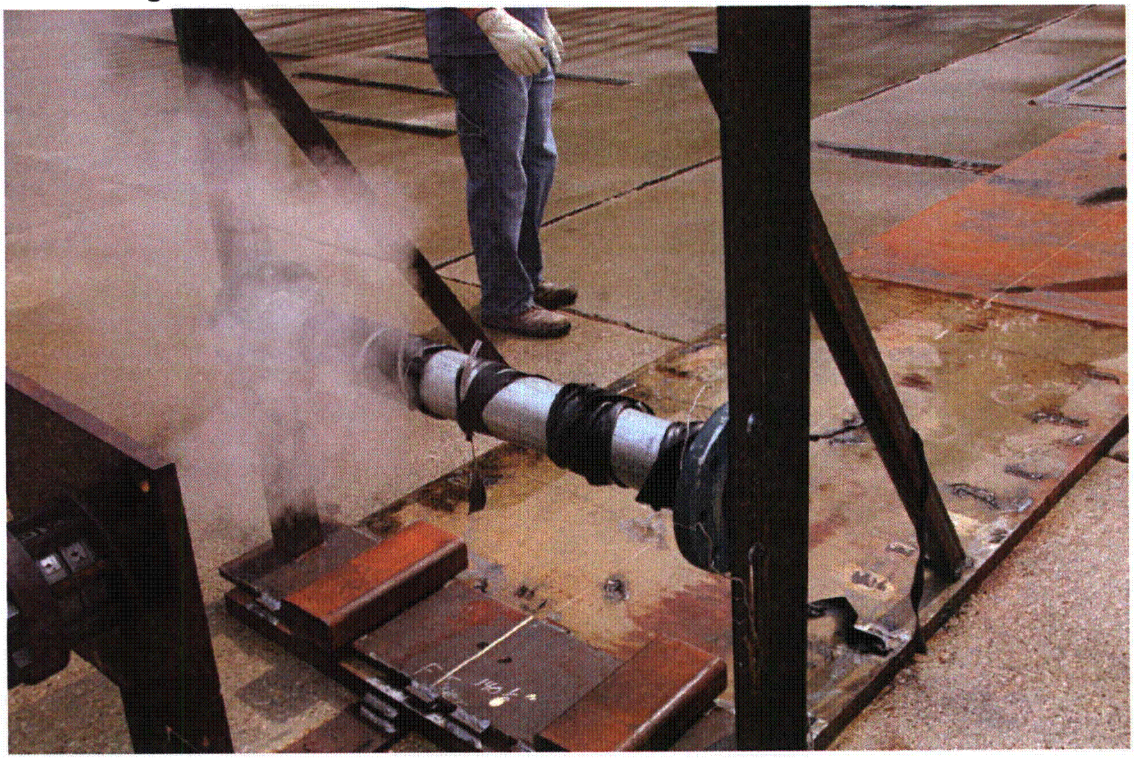


Figure A5-42 Scotch 77 Fire Retardant Tape Test 1 Post-Test Picture

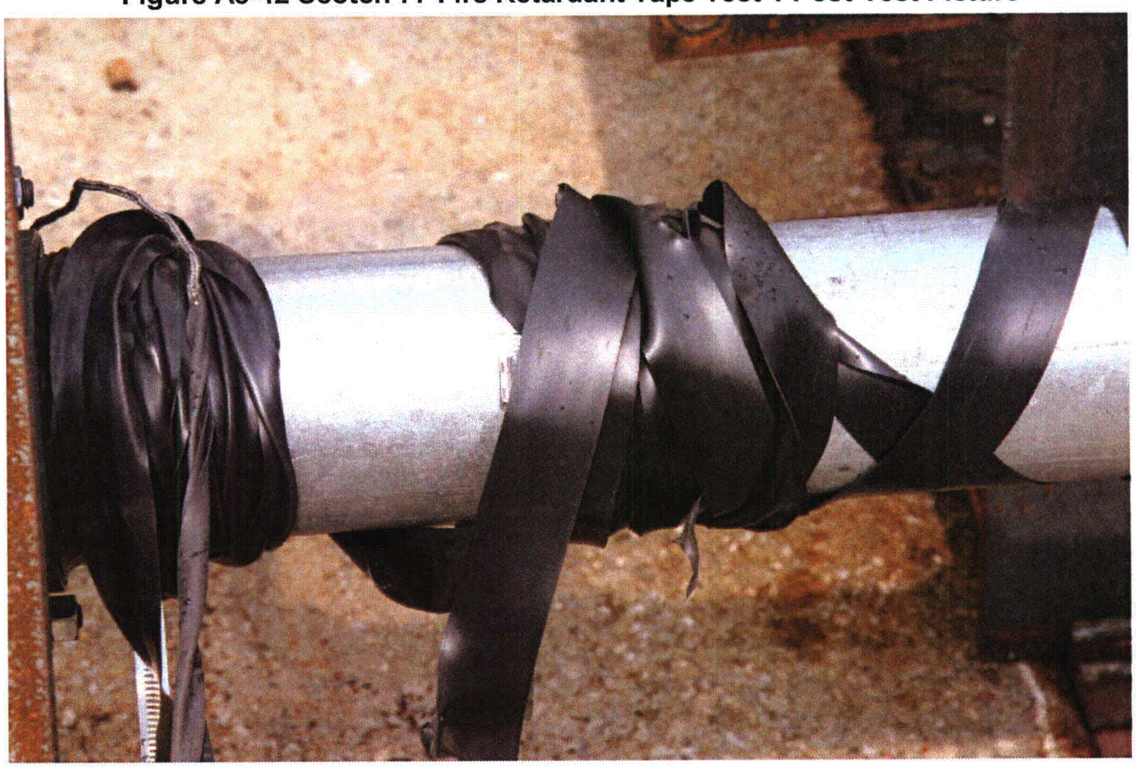


Figure A5-43 Scotch 77 Fire Retardant Tape Test 1 Post-Test Picture

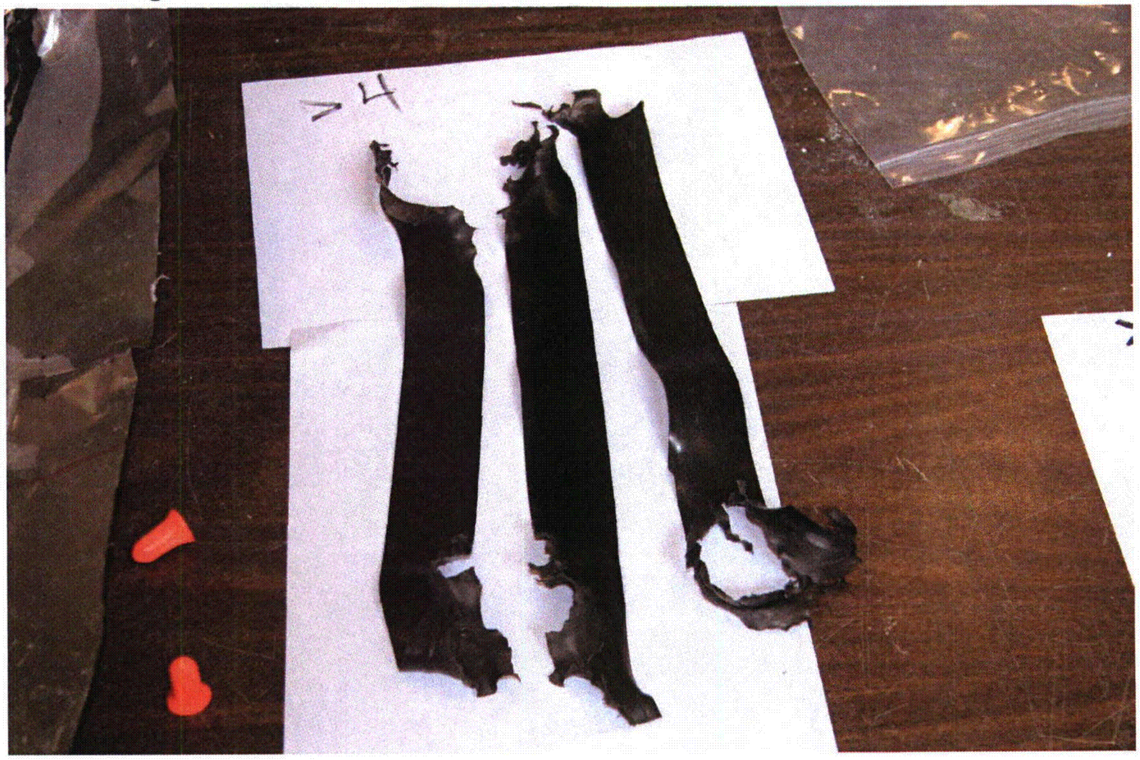


Figure A5-44 Scotch 77 Fire Retardant Tape Test 2 Pre-Test Picture

Figure A5-45 Scotch 77 Fire Retardant Tape Test 2 Post-Test Picture

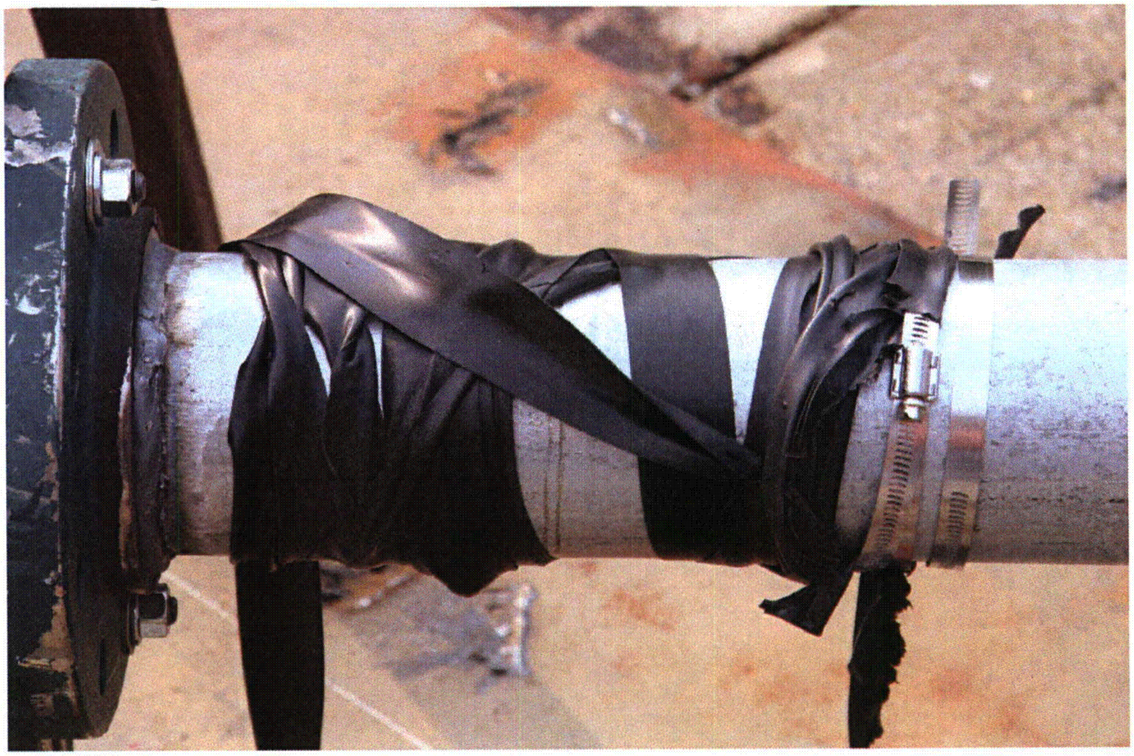


Figure A5-46 Scotch 77 Fire Retardant Tape Test 2 Post-Test Picture

Figure A5-47 Scotch 77 Fire Retardant Tape Test 3 Pre-Test Picture

Figure A5-48 Scotch 77 Fire Retardant Tape Test 3 Post-Test Picture

Figure A5-49 Scotch 77 Fire Retardant Tape Test 4 Pre-Test Picture

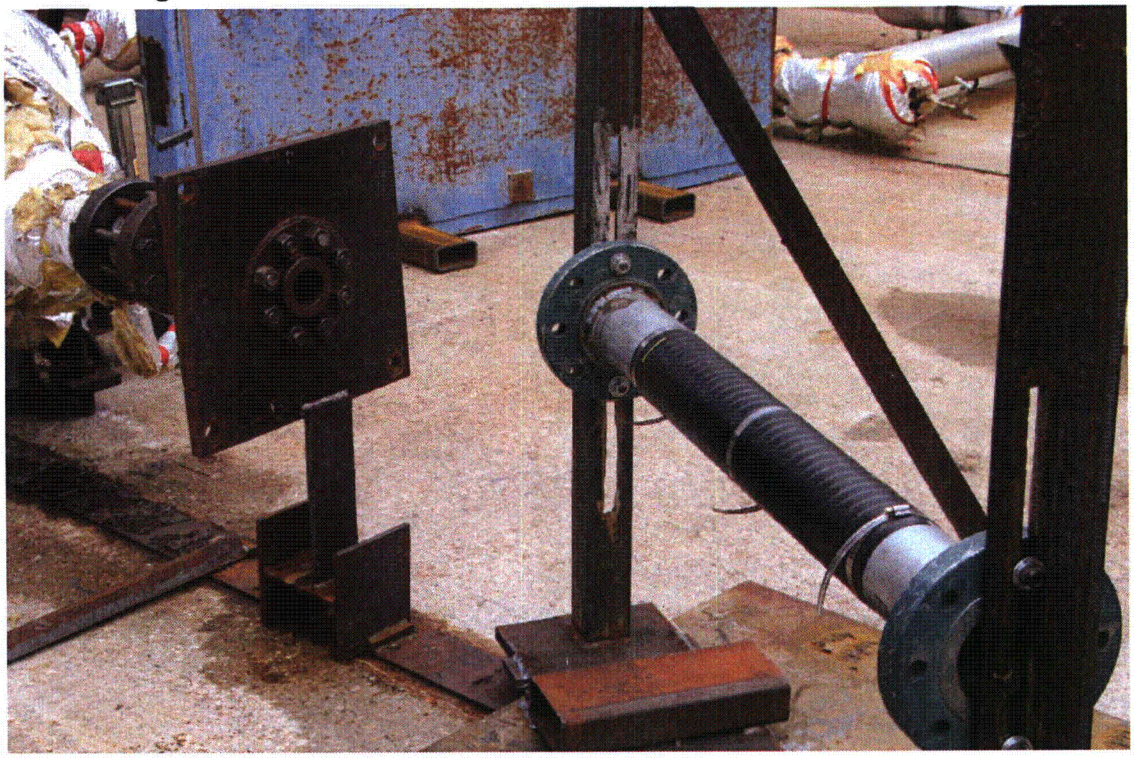


Figure A5-50 Scotch 77 Fire Retardant Tape Test 4 Post-Test Picture

Figure A5-51 Scotch 77 Fire Retardant Tape Test 5 Pre-Test Picture

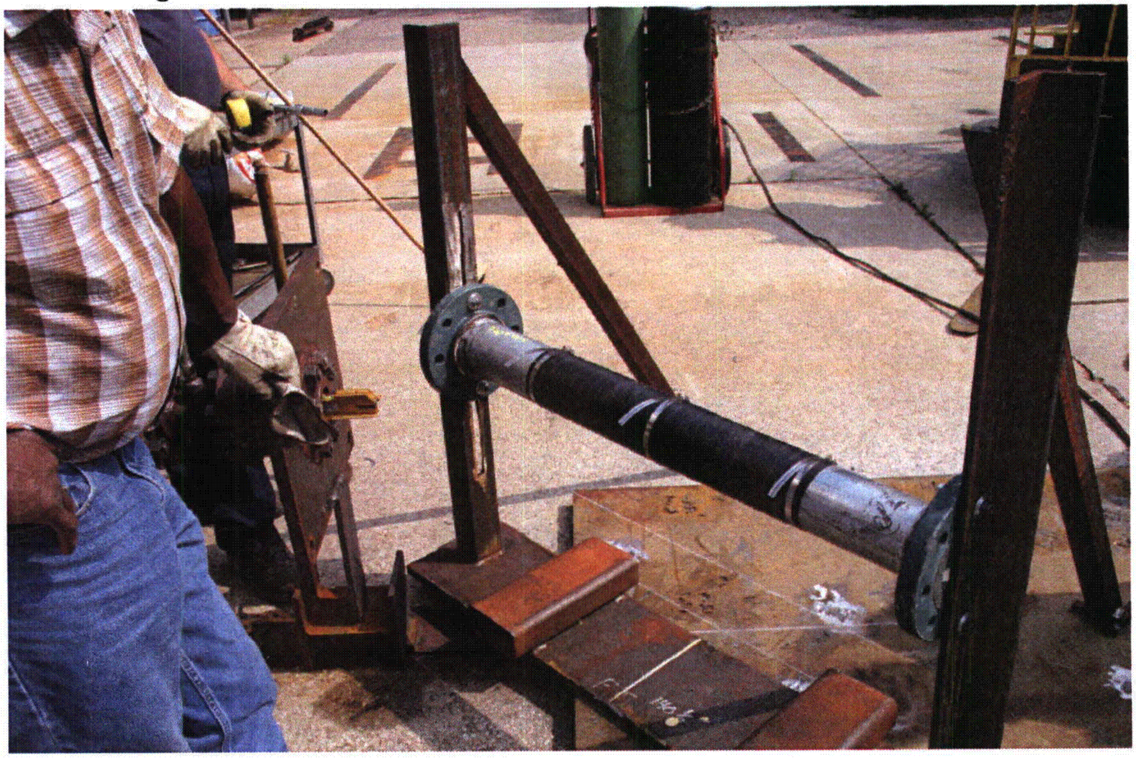


Figure A5-52 Scotch 77 Fire Retardant Tape Test 5 Post-Test Picture

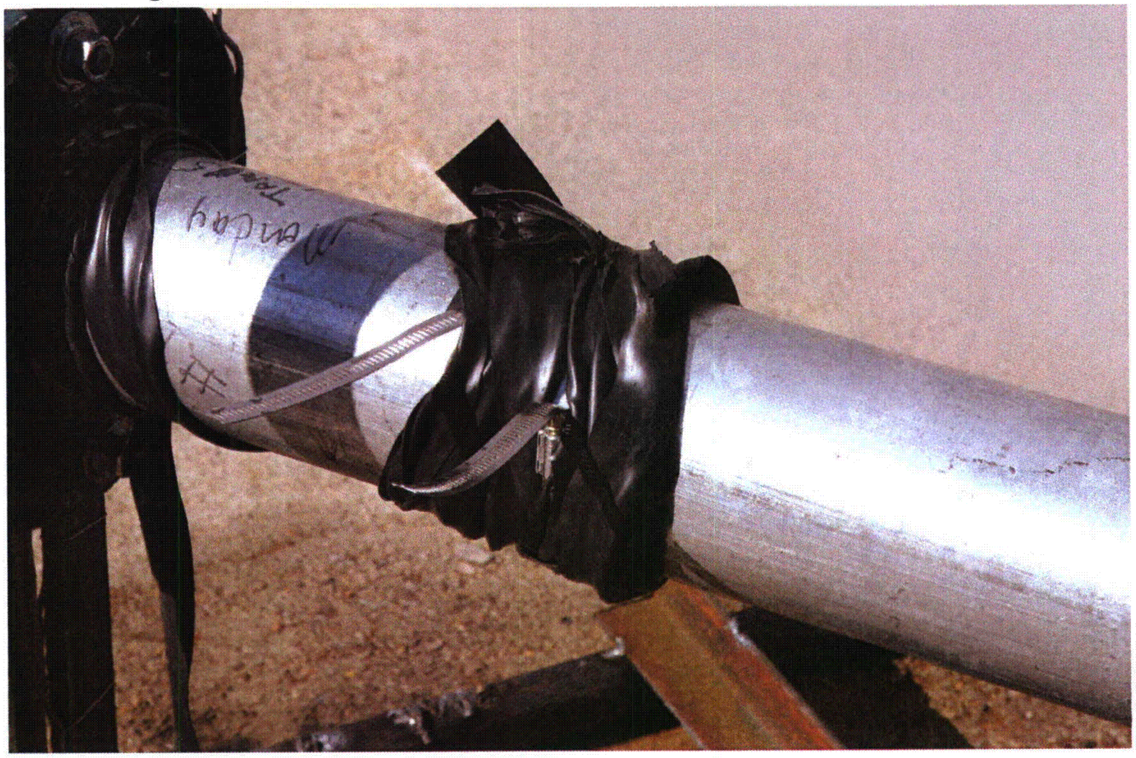


Figure A5-53 Scotch 77 Fire Retardant Tape Test 5 Post-Test Picture

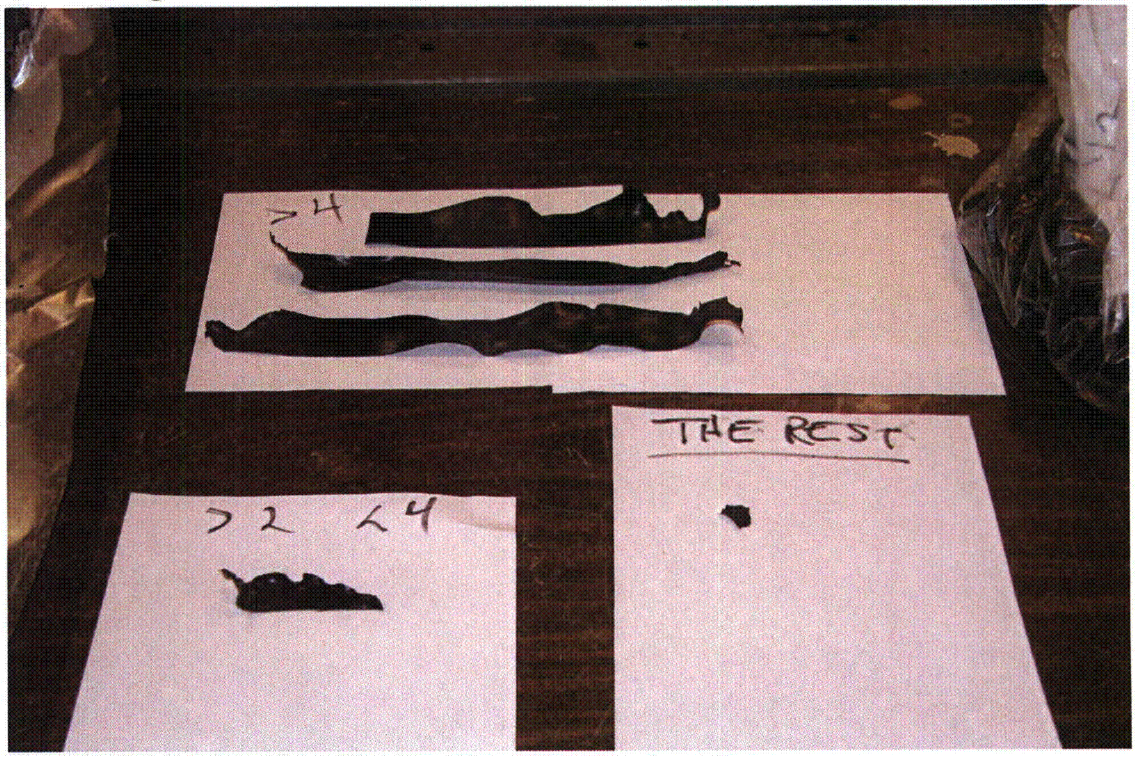


Figure A5-54 Electromark Labels Test 1 Pre-Test Picture

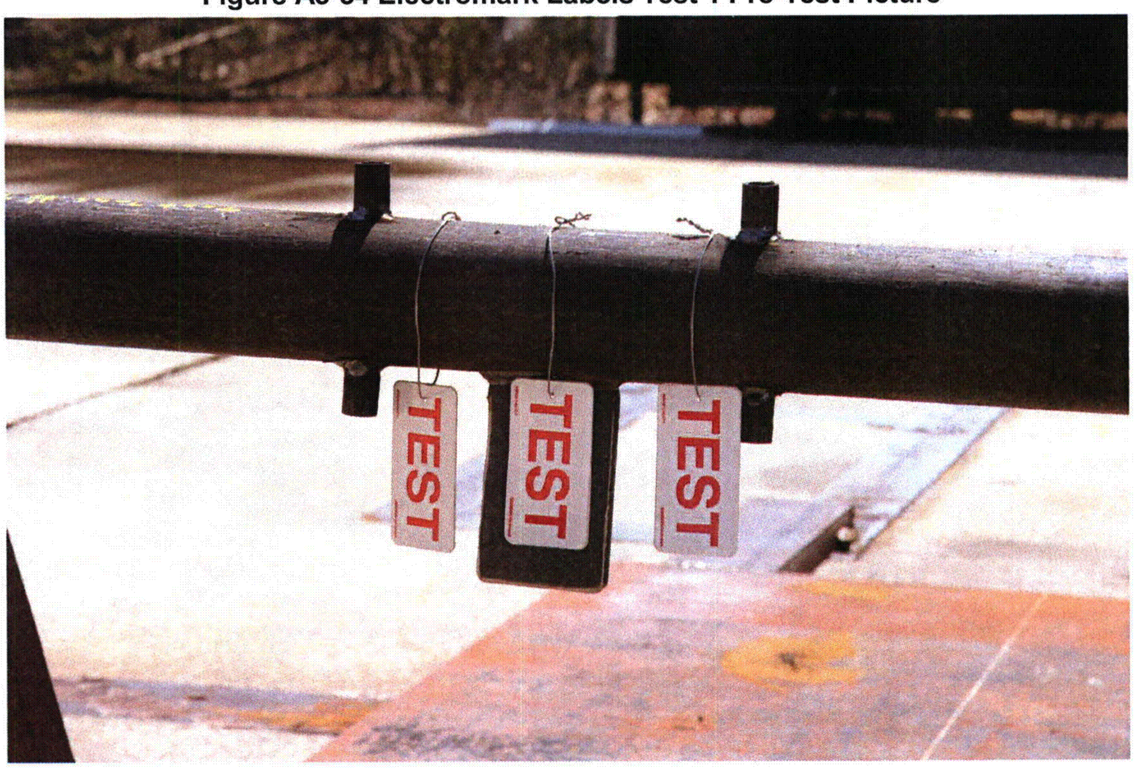


Figure A5-55 Electromark Labels Test 1 Post-Test Picture

Figure A5-56 Electromark Labels Test 2 Pre-Test Picture

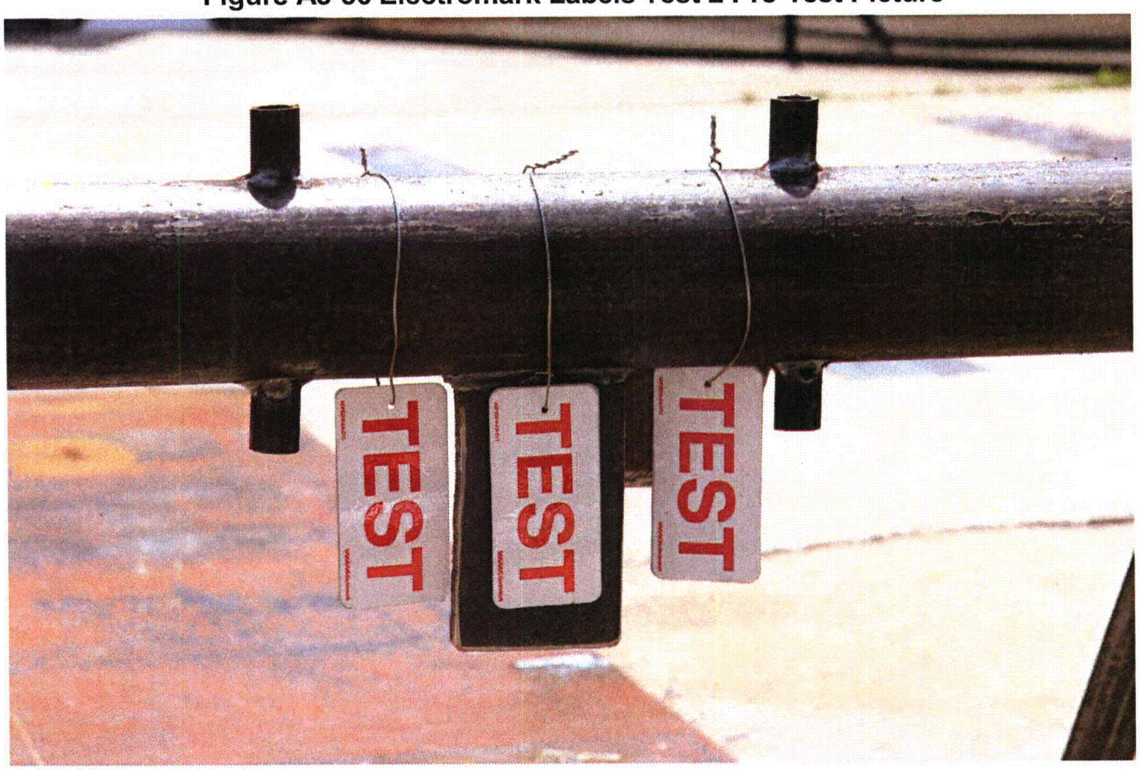


Figure A5-57 Electromark Labels Test 2 Post-Test Picture

Figure A5-58 Electromark Labels Test 3 Pre-Test Picture

Figure A5-59 Electromark Labels Test 3 Post-Test Picture

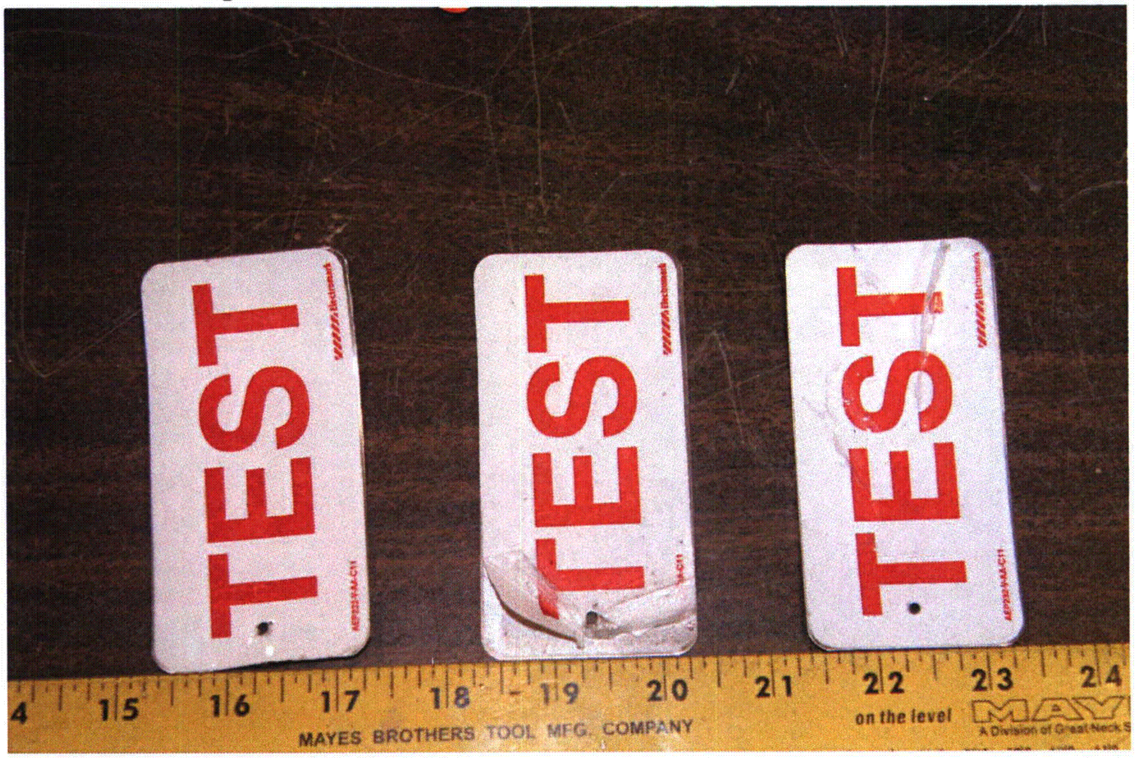


Figure A5-60 Electromark Labels Test 4 Pre-Test Picture

Figure A5-61 Electromark Labels Test 4 Post-Test Picture

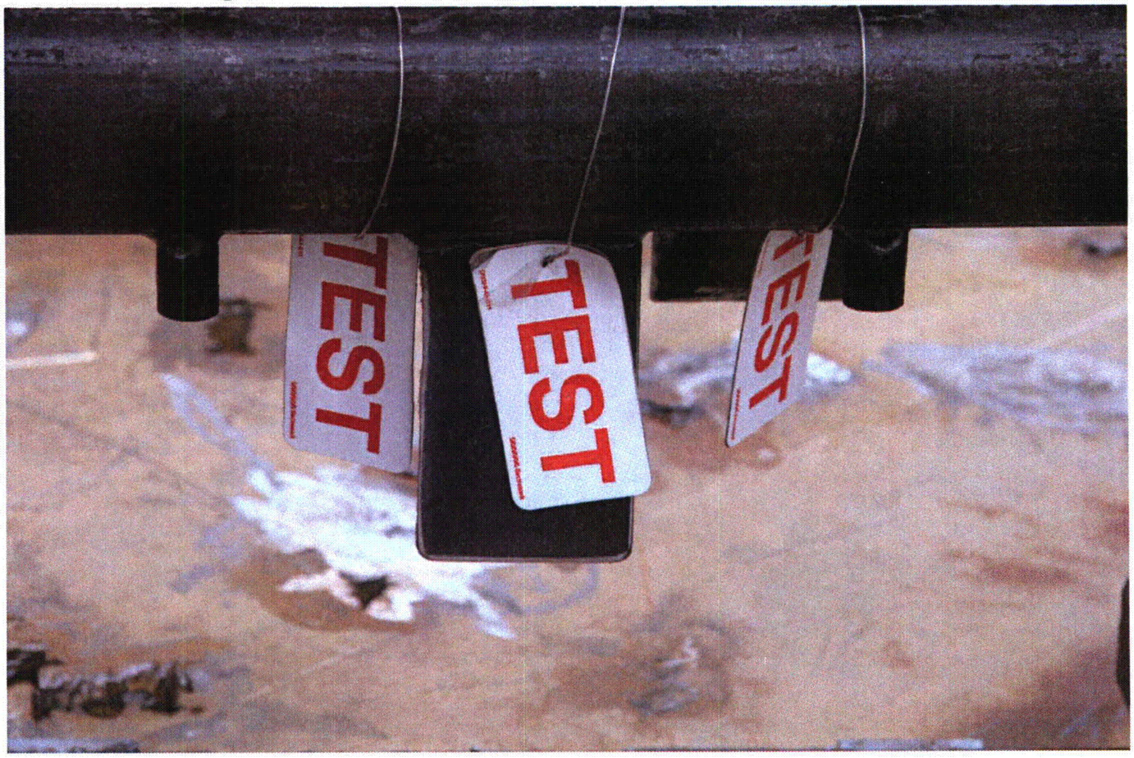


Figure A5-62 Jacketed Armaflex Insulation Test 1 Pre-Test Picture

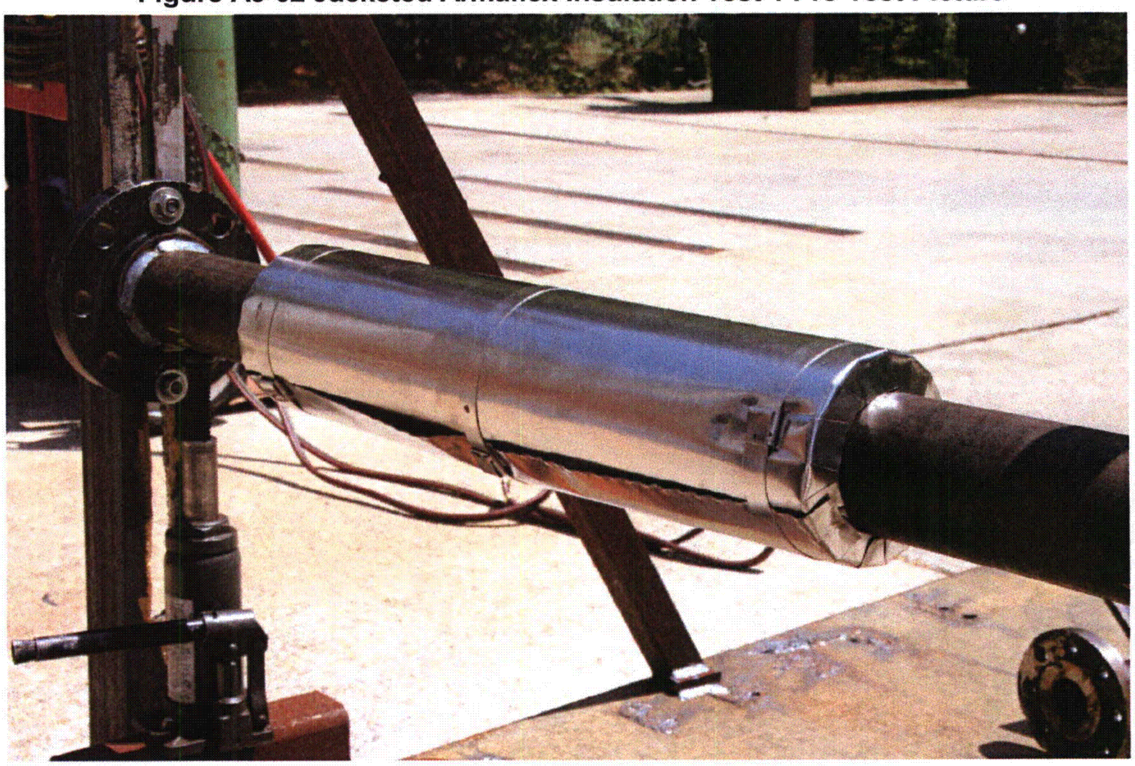


Figure A5-63 Jacketed Armaflex Insulation Test 1 Post-Test Picture

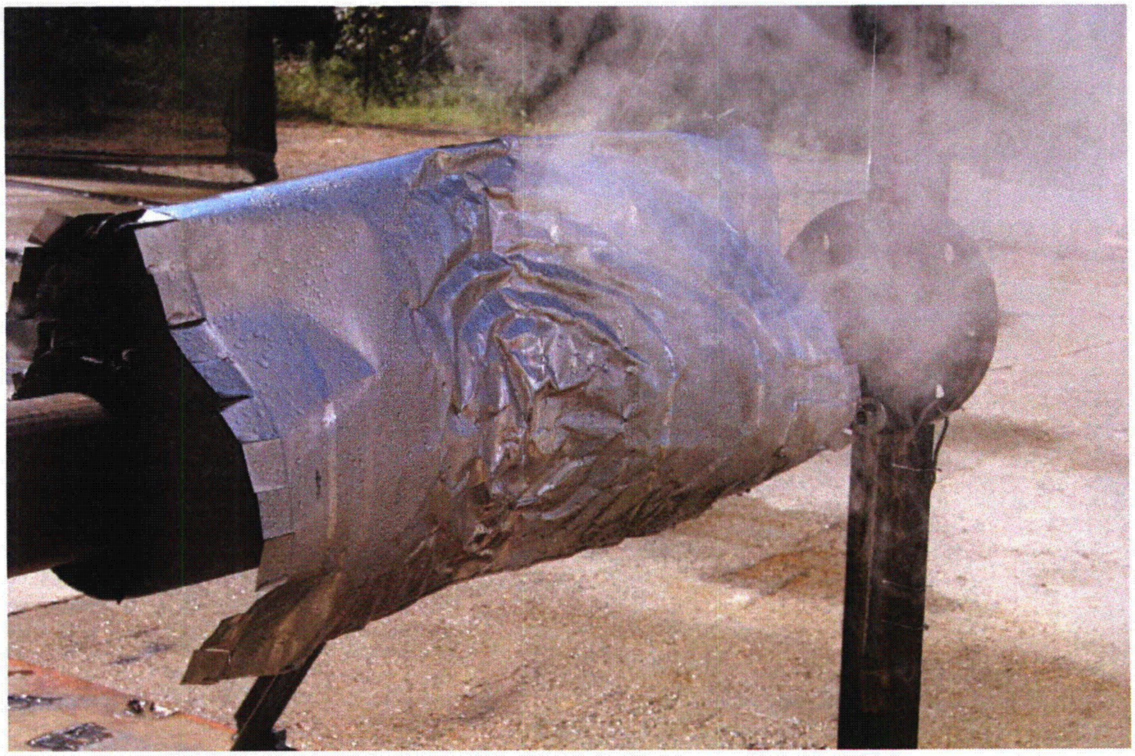


Figure A5-64 Jacketed Armaflex Insulation Test 1 Post-Test Picture

Figure A5-65 Jacketed Armaflex Insulation Test 1 Post-Test Picture

Figure A5-66 Jacketed Armaflex Insulation Test 2 Pre-Test Picture

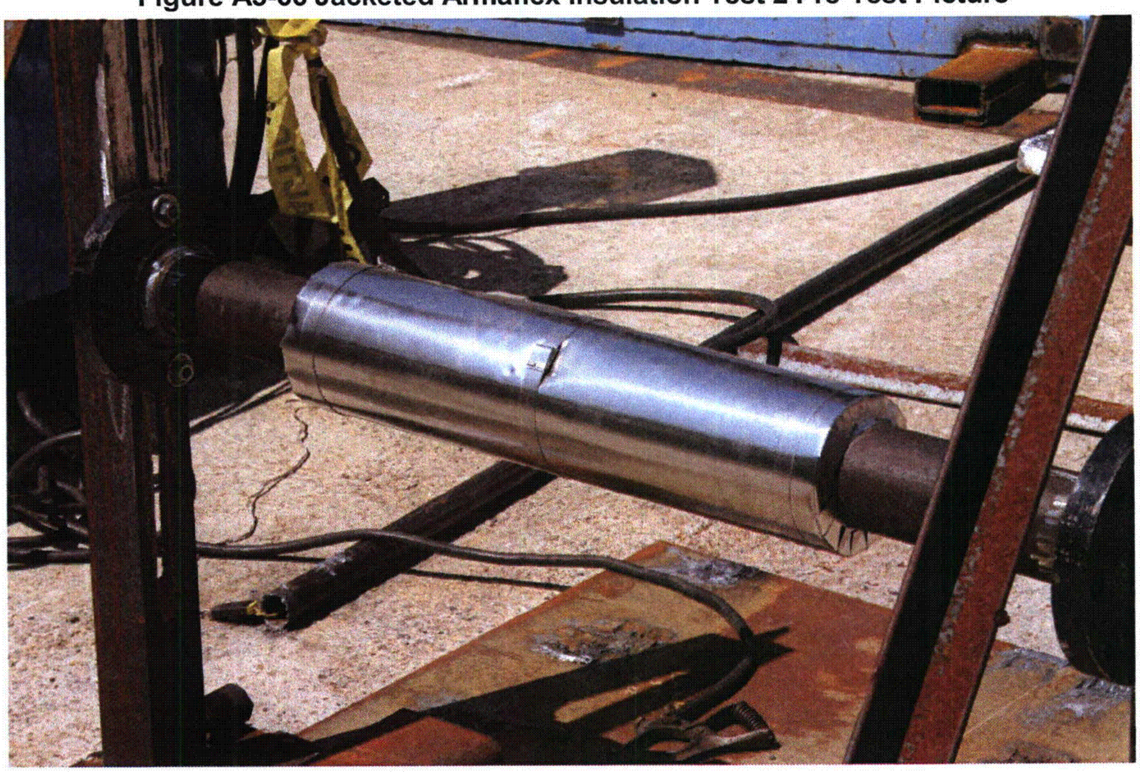


Figure A5-67 Jacketed Armaflex Insulation Test 2 Post-Test Picture

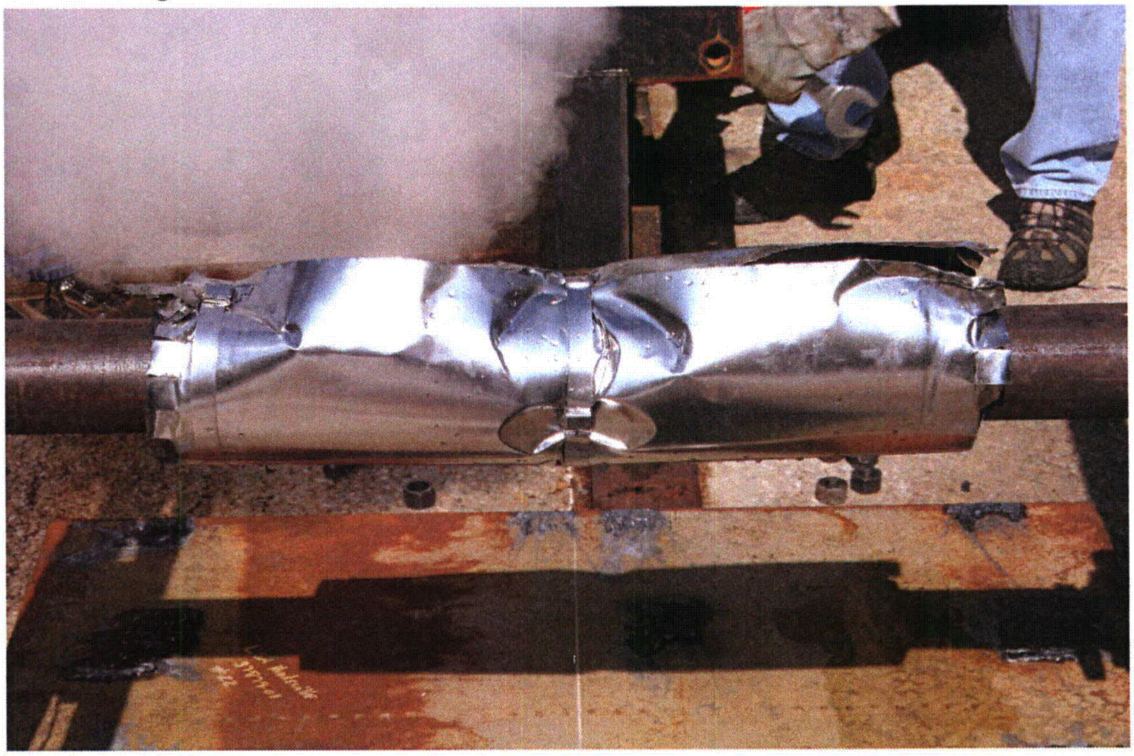


Figure A5-68 Jacketed Armaflex Insulation Test 2 Post-Test Picture

Figure A5-69 Jacketed Armaflex Insulation Test 2 Post-Test Picture

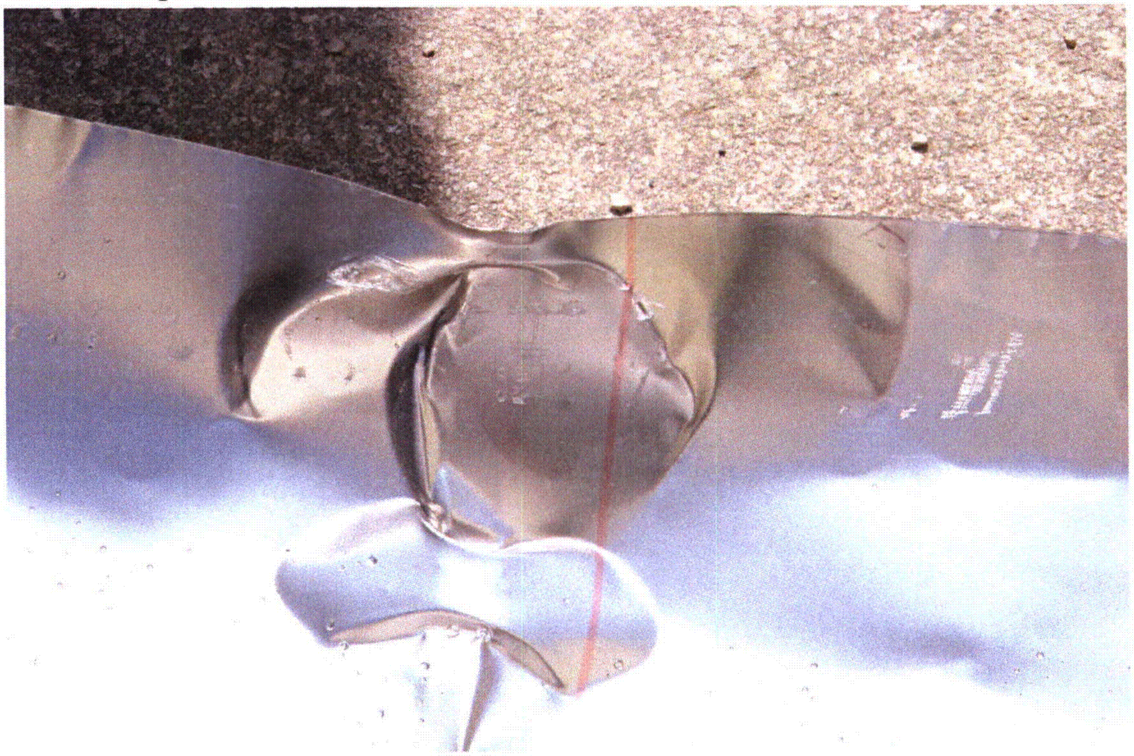


Figure A5-70 Jacketed Armaflex Insulation Test 3 Pre-Test Picture

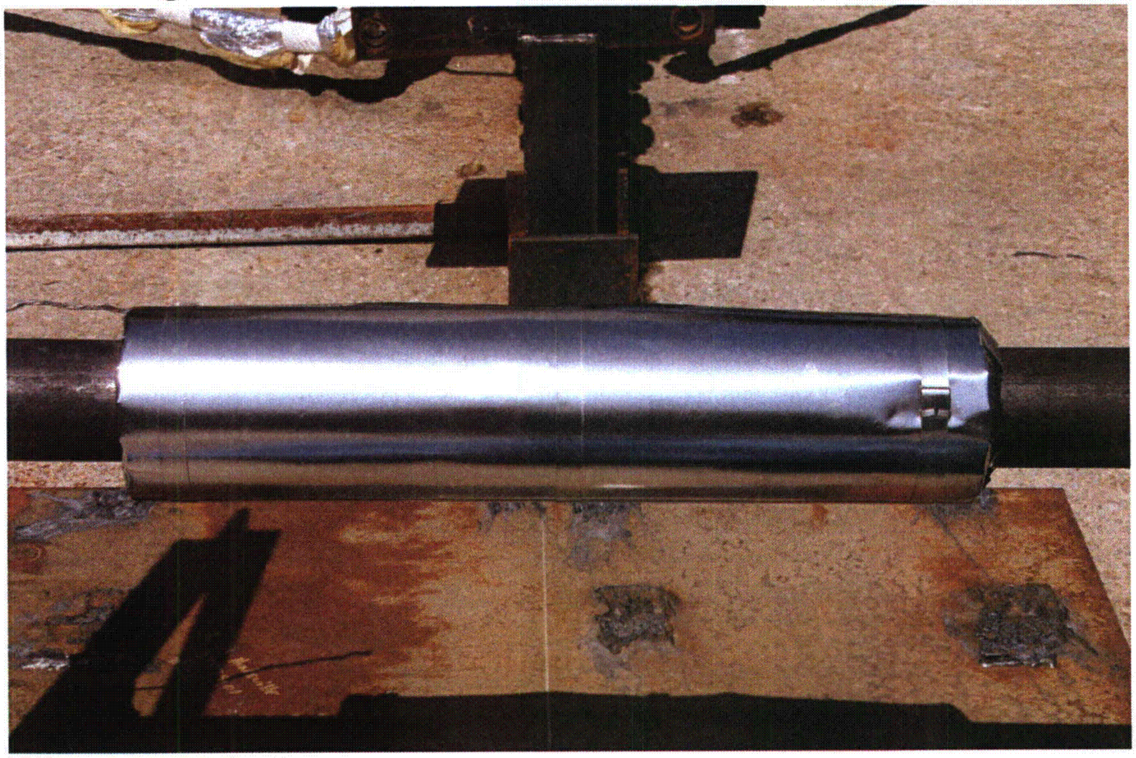


Figure A5-71 Jacketed Armaflex Insulation Test 3 Post-Test Picture

Figure A5-72 Jacketed Armaflex Insulation Test 3 Post-Test Picture

Figure A5-73 Jacketed Armaflex Insulation Test 3 Post-Test Picture

Figure A5-74 Jacketed Armaflex Insulation Test 4 Pre-Test Picture

Figure A5-75 Jacketed Armaflex Insulation Test 4 Post-Test Picture

Figure A5-76 Jacketed Armaflex Insulation Test 4 Post-Test Picture

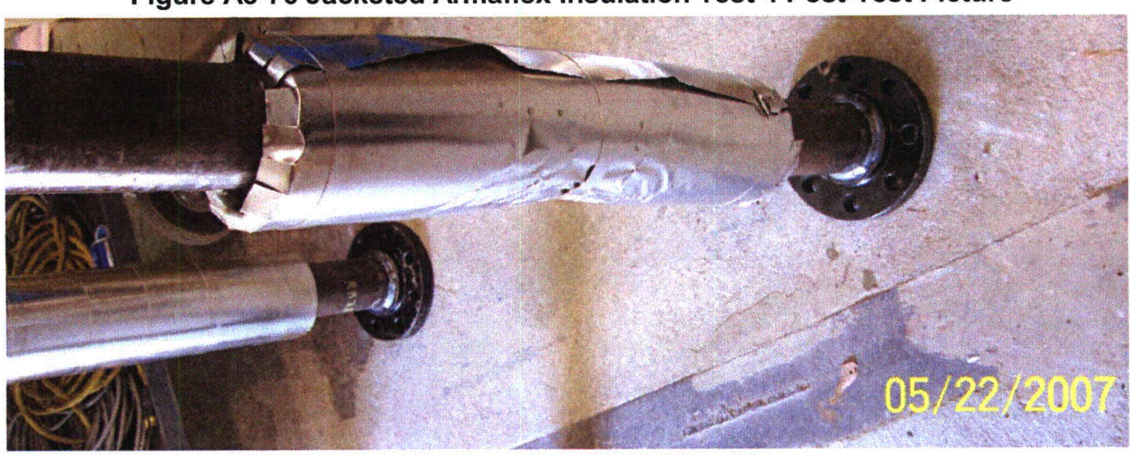


Figure A5-77 Jacketed Armaflex Insulation Test 4 Post-Test Picture

Figure A5-78 Jacketed Armaflex Insulation Test 5 Pre-Test Picture

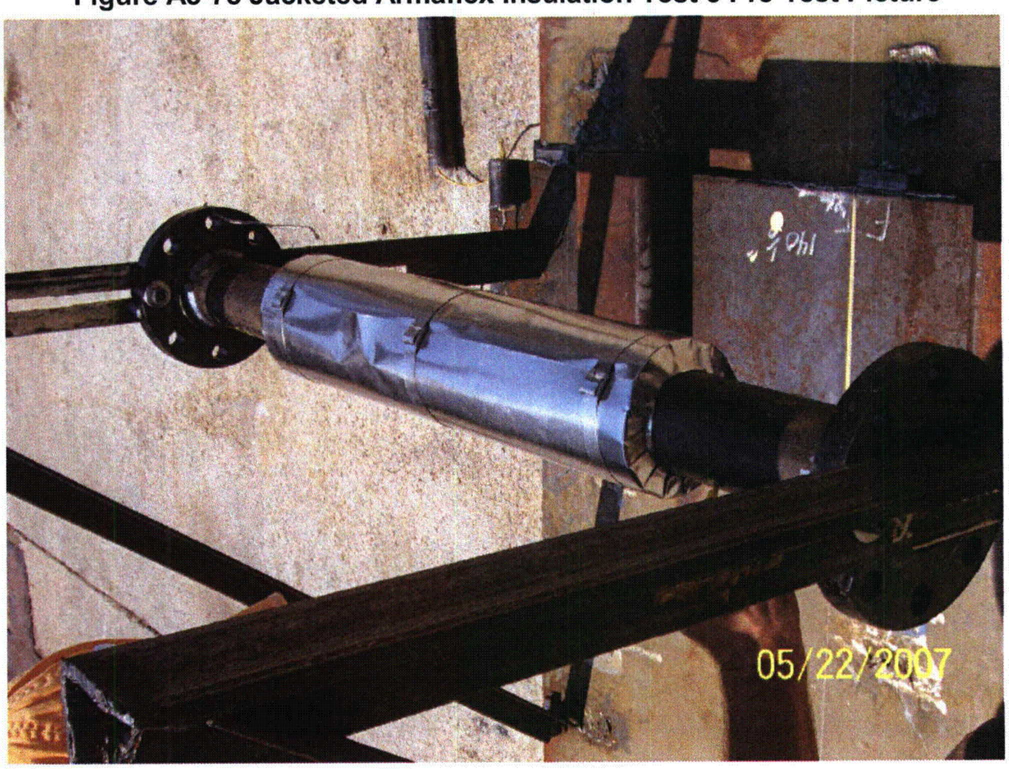


Figure A5-79 Jacketed Armaflex Insulation Test 5 Post-Test Picture

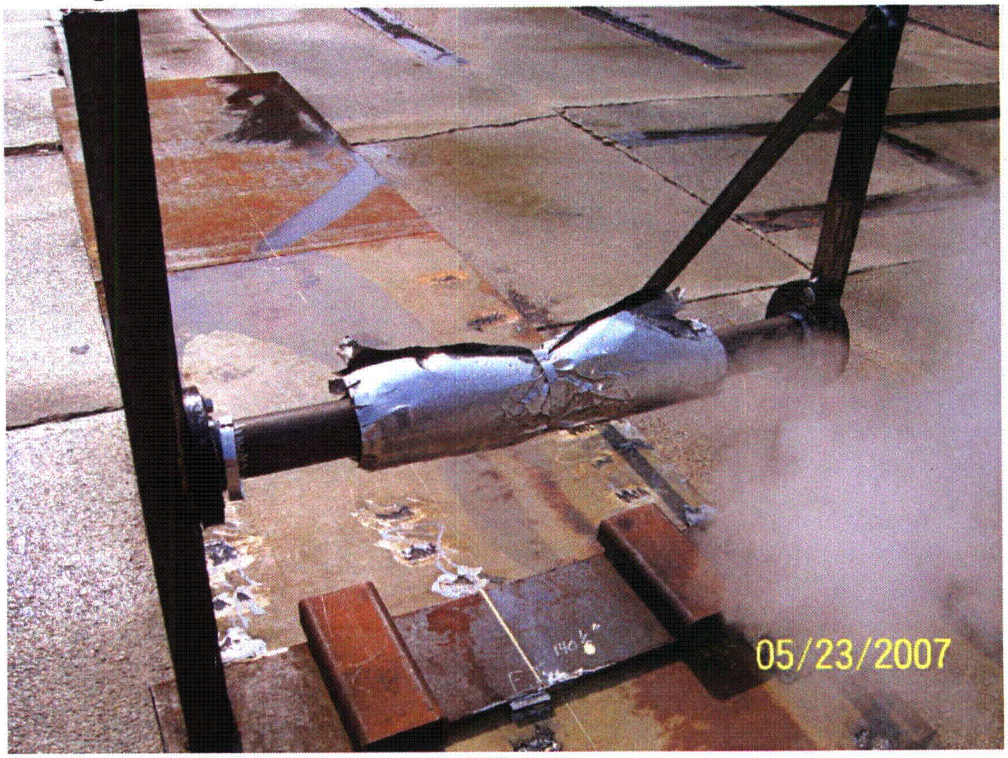


Figure A5-80 Jacketed Armaflex Insulation Test 5 Post-Test Picture

Figure A5-81 Jacketed Armaflex Insulation Test 5 Post-Test Picture

Figure A5-82 Jacketed Armaflex Insulation Test 5 Post-Test Picture

Figure A5-83 Jacketed Armaflex Insulation Test 6 Pre-Test Picture

Figure A5-84 Jacketed Armaflex Insulation Test 6 Post-Test Picture

Figure A5-85 Jacketed Armaflex Insulation Test 6 Post-Test Picture

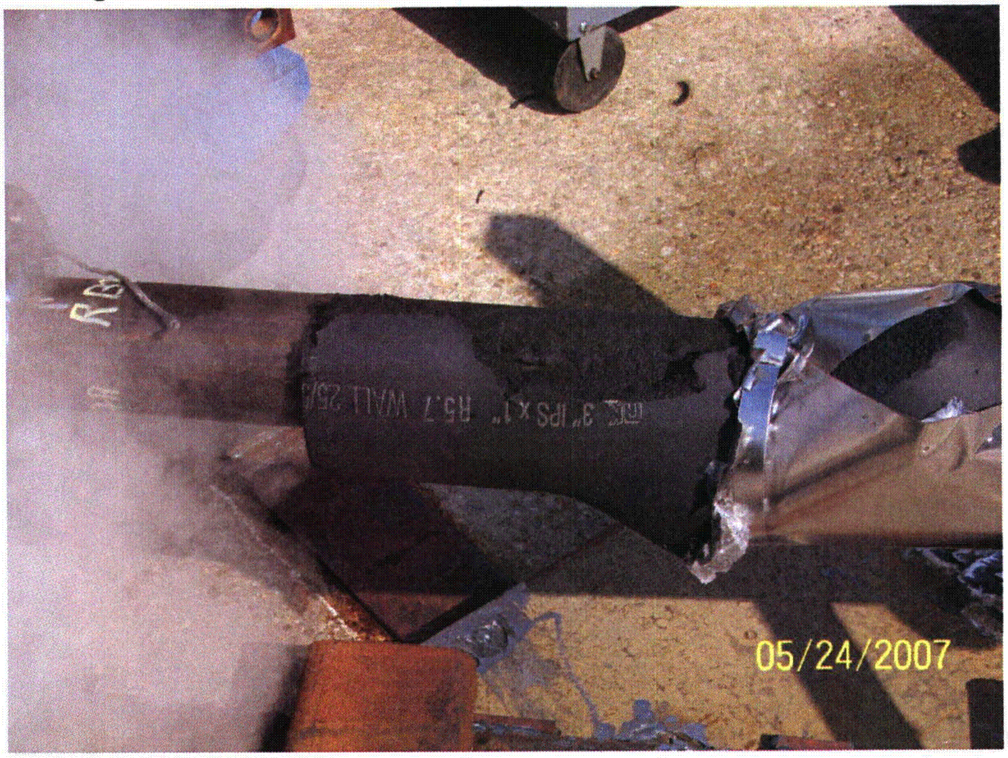


Figure A5-86 Jacketed Armaflex Insulation Test 6 Post-Test Picture

Figure A5-87 Jacketed Armaflex Insulation Test 6 Post-Test Picture

Figure A5-88 Jacketed Armaflex Insulation Test 7 Pre-Test Picture

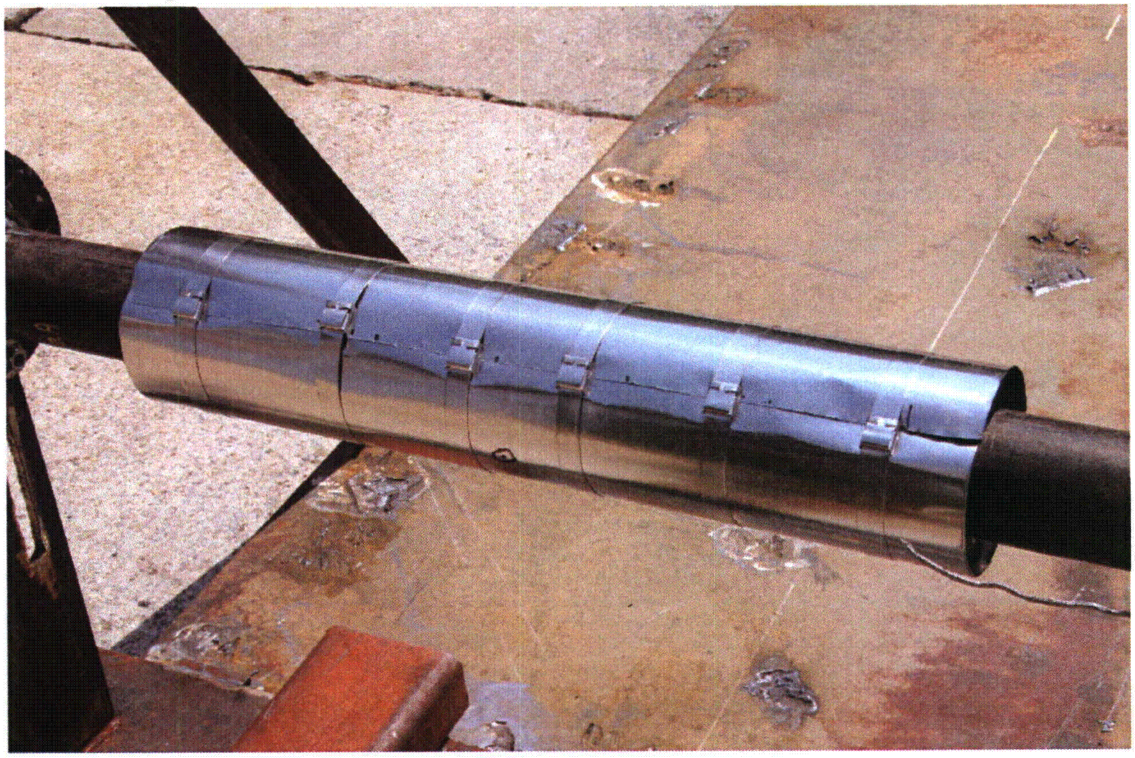


Figure A5-89 Jacketed Armaflex Insulation Test 7 Post-Test Picture

Figure A5-90 Jacketed Armaflex Insulation Test 7 Post-Test Picture

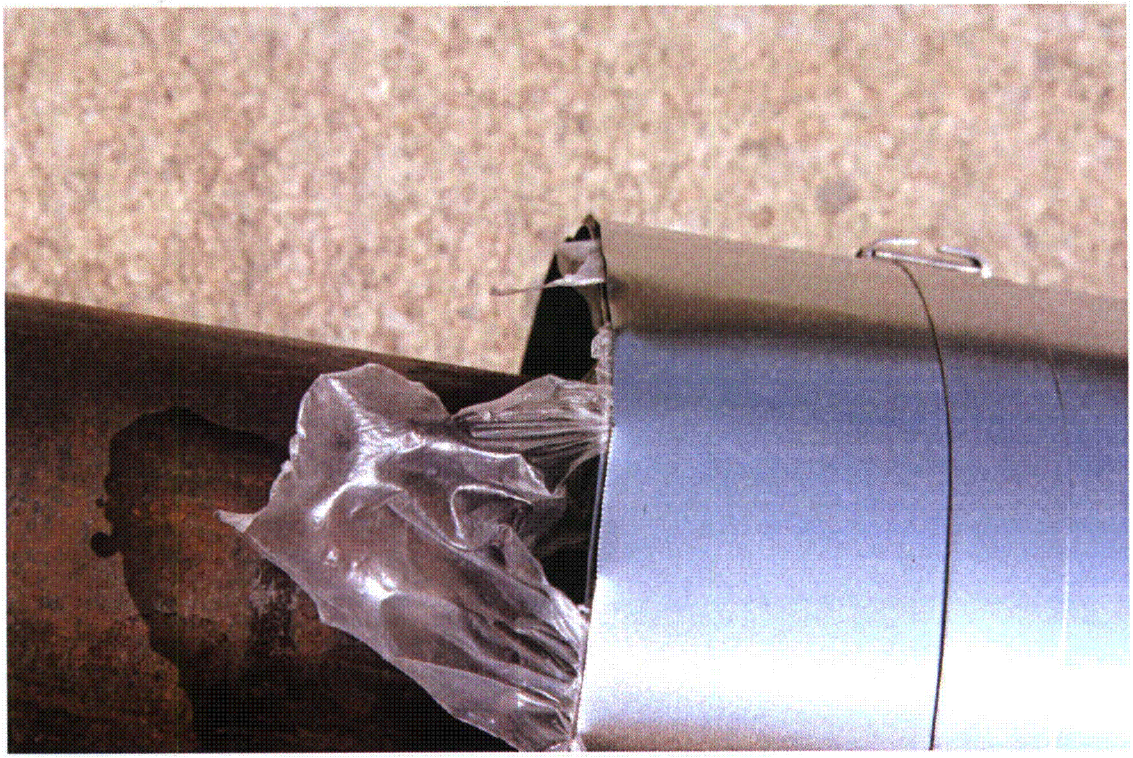


Figure A5-91 Jacketed Armaflex Insulation Test 8 Picture

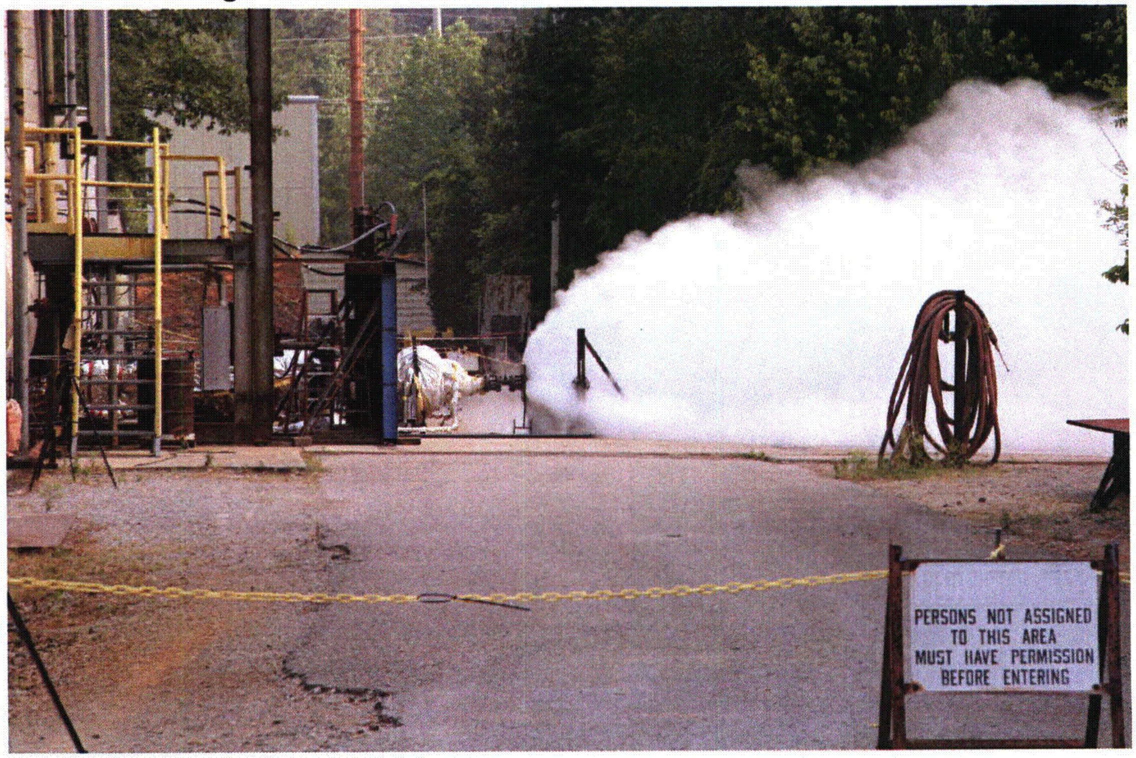


Figure A5-92 Jacketed Armaflex Insulation Test 8 Post-Test Picture

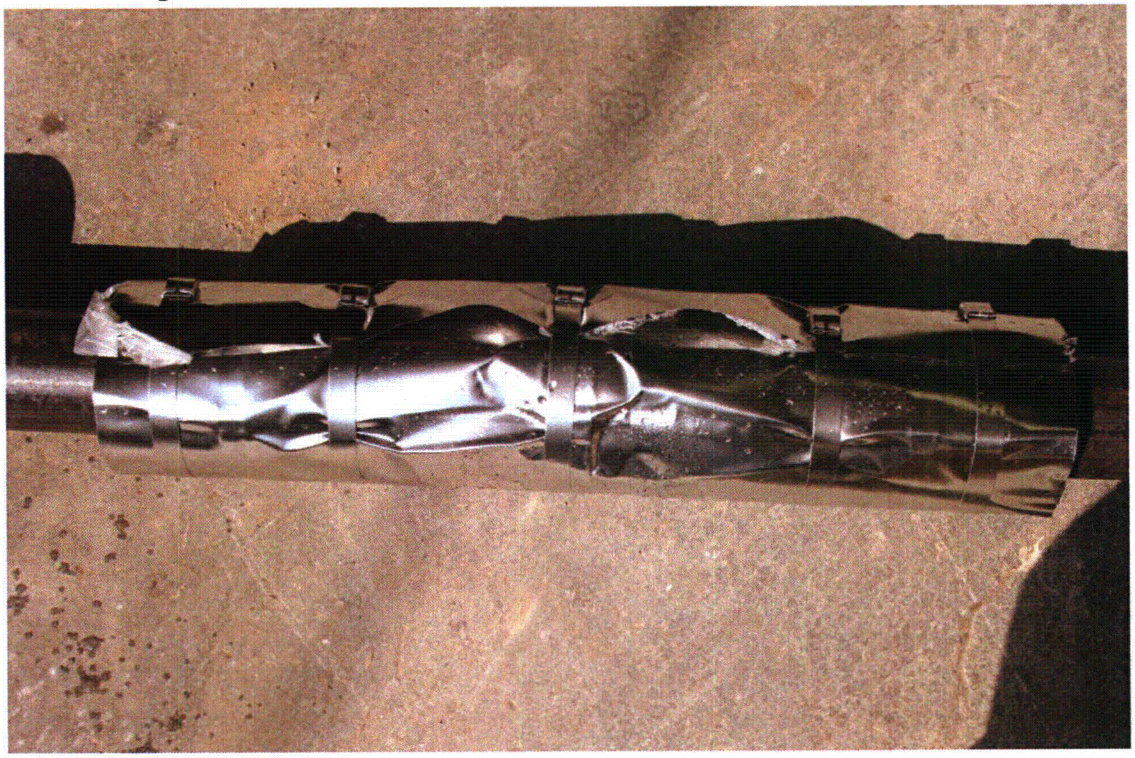


Figure A5-93 Jacketed Armaflex Insulation Test 9 Pre-Test Picture

Figure A5-94 Jacketed Armaflex Insulation Test 9 Post-Test Picture

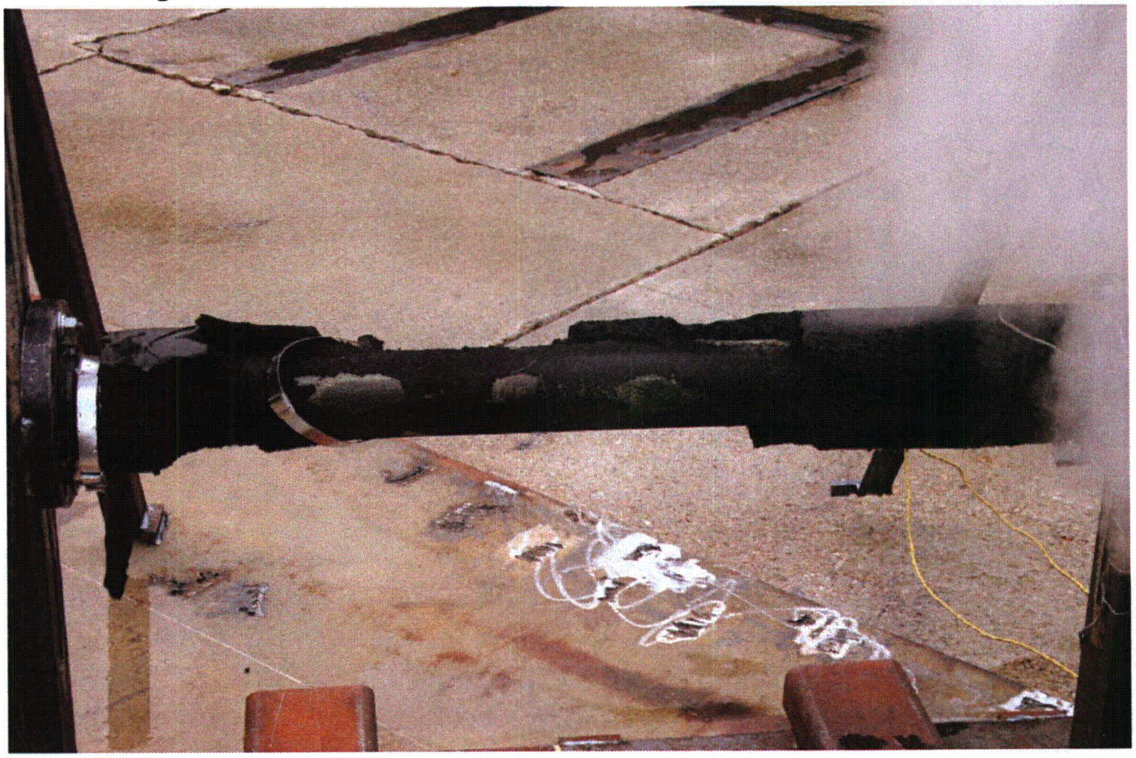


Figure A5-95 Jacketed Armaflex Insulation Test 10 Pre-Test Picture

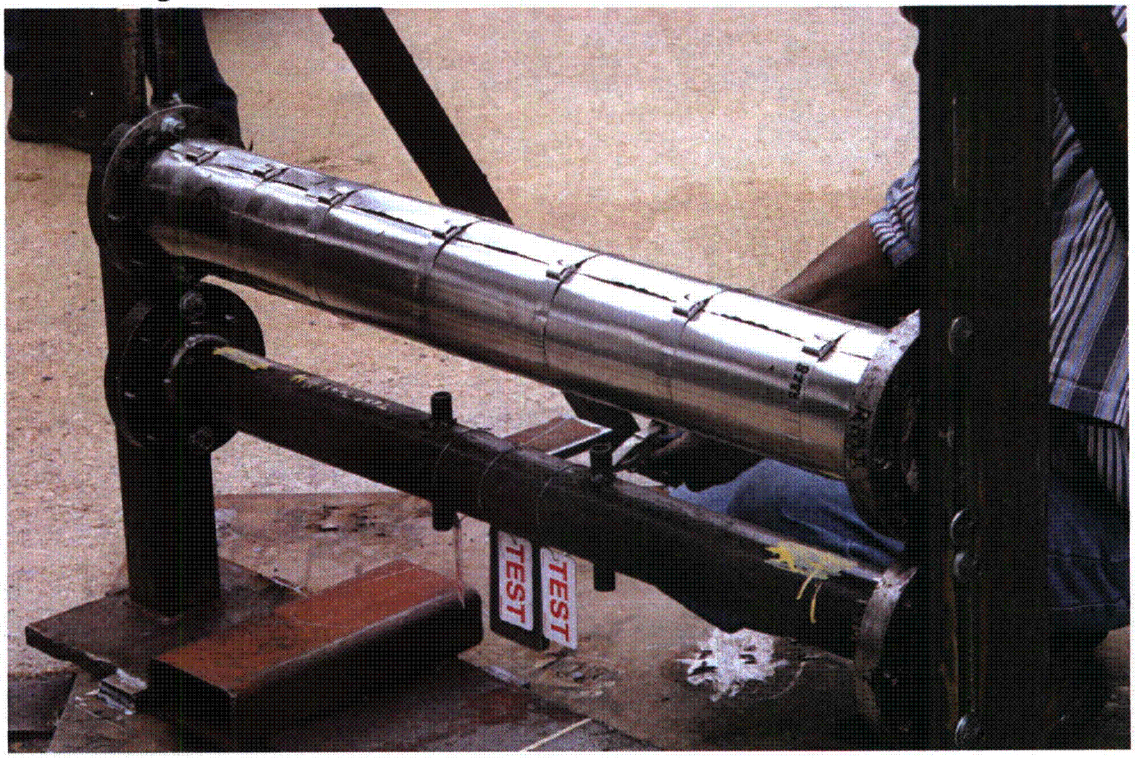


Figure A5-96 Jacketed Armaflex Insulation Test 10 Post-Test Picture

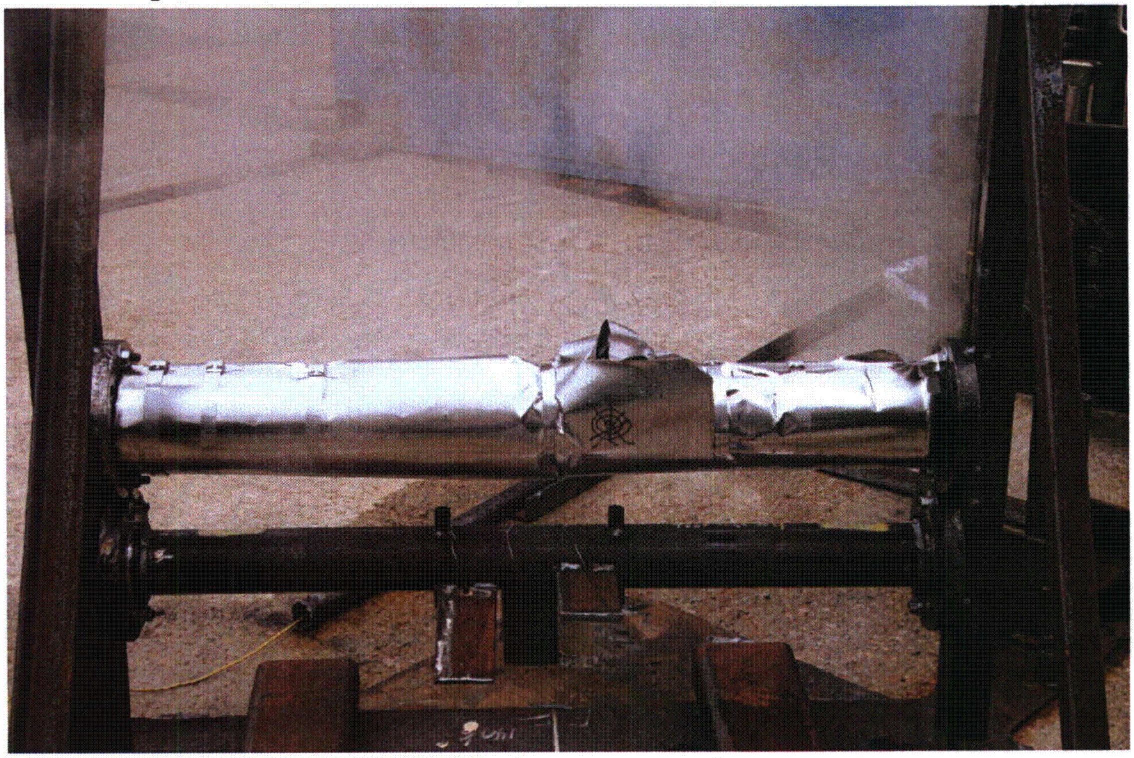
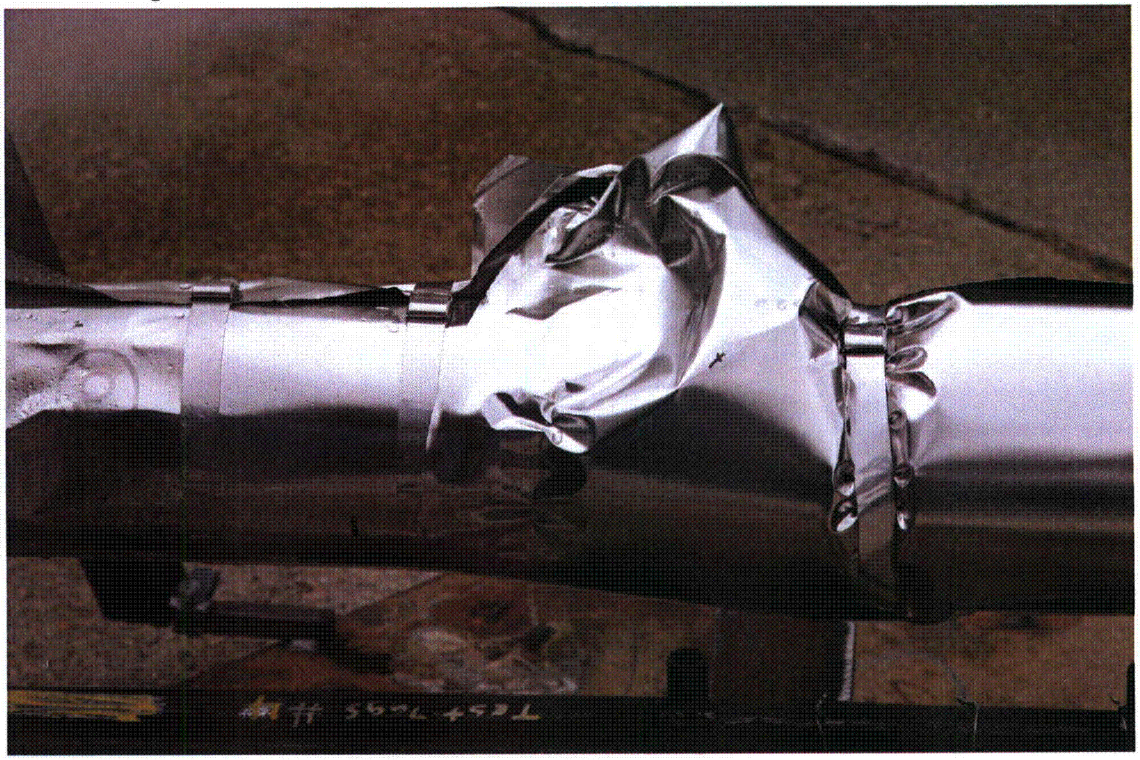


Figure A5-97 Jacketed Armaflex Insulation Test 10 Post-Test Picture



RESPONSES TO NRC REQUEST FOR ADDITIONAL INFORMATION

Unless otherwise noted, the sections referenced are from Attachment 3.

No.	GL 2004-02 RAI Questions	GL 2004-02 RAI Responses
	Plant Materials	
1	*Not applicable.*	
2	*Identify the amounts (i.e., surface area) of the following materials that are:*	
2a	*(a) submerged in the containment pool following a loss-of-coolant accident (LOCA),*	
2a1	*- aluminum*	This value is provided in Table 3o4a-3, Containment Materials.
2a2	*- zinc (from galvanized steel and from inorganic zinc coatings)*	This value is provided in Table 3o4a-3, Containment Materials.
2a3	*- copper*	From Section 3.o.4.a) – Per WCAP-16530 methodology, this material is not considered as a participant in sump pool chemistry.
2a4	*- carbon steel not coated*	From Reference 148, there is no carbon steel that is not coated.
2a5	*- uncoated concrete*	This value is provided in Table 3o4a-3, Containment Materials.
2b	*(b) in the containment spray zone following a LOCA:*	
2b1	*- aluminum*	This value is provided in Table 3o4a-3, Containment Materials.
2b2	*- zinc (from galvanized steel and from inorganic zinc coatings)*	This value is provided in Table 3o4a-3, Containment Materials.
2b3	*- copper*	From Section 3.o.4.a) - Per WCAP-16530 methodology, this material is not considered as a participant in sump pool chemistry.
2b4	*- carbon steel not coated*	From Reference 148, there is 32,666 ft^2 of carbon steel that is not coated.
2b5	*- uncoated concrete*	This value is provided in Table 3o4a-3, Containment Materials.

No.	GL 2004-02 RAI Questions	GL 2004-02 RAI Responses
2c	*Compare the amounts of these materials in the submerged and spray zones at your plant relative to the scaled amounts of these materials used in the Nuclear Regulatory Commission (NRC) nuclear industry jointly-sponsored Integrated Chemical Effects Tests (ICET) (e.g., 5x the amount of uncoated carbon steel assumed for the ICETs).*	A comparison between the ICET material quantities and the quantities used for testing at the strainer vendor, CCI, was not performed since an additional 30-day integrated chemical effects test was also performed, and there was not an ICET that matched the CNP environment. As stated in the response to Information Item 3.o, the results of the 30-day test will be provided in the final response to GL 2004-02.
2c1	*- aluminum*	Refer to the response to Information Item 3.o for the quantities of materials used for chemical effects testing at the strainer vendor CCI. The total quantity of zinc coated steel material in containment is 71,162 ft^2 (submerged) and 504,728 ft^2 (non-submerged). The total quantity of copper is 1022 ft^2 (submerged) and 39,735 ft^2 (unsubmerged). The total quantity of uncoated carbon steel is 32,666 ft^2 (unsubmerged).
2c2	*- zinc (from galvanized steel and from inorganic zinc coatings)*	
2c3	*- copper*	
2c4	*- carbon steel not coated*	
2c5	*- uncoated concrete*	
3	*Identify the amount (surface area) and material (e.g., aluminum) for any scaffolding stored in containment. Indicate the amount, if any, that would be submerged in the containment pool following a LOCA. Clarify if scaffolding material was included in the response to Question 2.*	CNP does not currently have any scaffold material stored in containment. However, procedures allow locating a small quantity of galvanized scaffolding material in the annulus region (submerged) or upper containment (subject to spray) to support on-line work. This quantity would be insignificant compared to the total quantity of galvanized steel in containment. Therefore, scaffolding material was not included in Table 3o4a-3, which is referenced in the response to Question 2.
4	*Provide the type and amount of any metallic paints or non-stainless steel insulation jacketing (not included in the response to Question 2) that would be either submerged or subjected to containment spray.*	CNP does not have any metallic paints that would be exposed to spray or be submerged in the containment pool. The only known metallic paint in containment, other than cold galvanizing (which is accounted for as an unqualified coating), is applied to the ice condenser floor cooling isolation valves which are fully encapsulated and not subjected to jet impingement. CNP does not have any non-stainless steel insulation jacketing that would be submerged or subjected to spray.

No.	GL 2004-02 RAI Questions	GL 2004-02 RAI Responses
	Containment Pool Chemistry	
5	*Provide the expected containment pool pH during the emergency core cooling system (ECCS) recirculation mission time following a LOCA at the beginning of the fuel cycle and at the end of the fuel cycle. Identify any key assumptions.*	The values for the assumed pool pH values are provided in Table 3o4a-2, "pH Time History & Water Volumes." The CNP calculation that provided the input to the CNP post-LOCA chemical effects analysis (Reference 147) assumed both a maximum RCS boron concentration and minimum RCS boron concentration, reflective of beginning of fuel cycle and end of fuel cycle conditions, for determination of minimum and maximum pH conditions.
6	*For the ICET environment that is the most similar to your plant conditions, compare the expected containment pool conditions to the ICET conditions for the following items: boron concentration, buffering agent concentration, and pH. Identify any other significant differences between the ICET environment and the expected plant-specific environment.*	The post-accident containment pool at CNP does not match any of the ICET environments. The conditions identified in ICET 4 are the closest to CNP conditions. However, ICET 4 does not include the sodium tetraborate contribution that would exist at CNP, and the pH is greater than determined for CNP. The response to Information Item 3.o.4 provides the values used for determination of chemical effects. The ICET data was not used for determination of pool conditions.
7	*For a LBLOCA, provide the time until ECCS external recirculation initiation and the associated pool temperature and pool volume. Provide estimated pool temperature and pool volume 24 hours after a LBLOCA. Identify the assumptions used for these estimates.*	The time until the initiation of the manual recirculation sequence is provided in the response to Information Item 3.g.5. The remaining information is provided in the response to Information Item 3.o.4. Figure 3o4a-2 provides the sump water temperature at approximately 24 hours of 138°F, which assumes minimum ice melt.
	Plant- Specific Chemical Effects	
8	*Discuss your overall strategy to evaluate potential chemical effects including demonstrating that, with chemical effects considered, there is sufficient net positive suction head (NPSH) margin available during the ECCS mission time. Provide an estimated date with milestones for the completion of all chemical effects evaluations.*	This information is provided in the response to Information Item 3.o.

No.	***GL 2004-02 RAI Questions***	**GL 2004-02 RAI Responses**
9	*Identify, if applicable, any plans to remove certain materials from the containment building and/or to make a change from the existing chemicals that buffer containment pool pH following a LOCA.*	The materials that were removed from containment are described in the response to Information Item 3.i.5. I&M currently has no plans to change any existing chemicals that buffer the containment pool pH following a LOCA.
10	*If bench-top testing is being used to inform plant specific head loss testing, indicate how the bench-top test parameters (e.g., buffering agent concentrations, pH, materials, etc.) compare to your plant conditions. Describe your plans for addressing uncertainties related to head loss from chemical effects including, but not limited to, use of chemical surrogates, scaling of sample size and test durations. Discuss how it will be determined that allowances made for chemical effects are conservative.*	The testing described in the response to Information Item 3.o used bench top testing at both CCI and ALION. The inputs for this bench top testing used plant-specific parameters (References 67, 69, and 153). The response to Information Item Section 3.o describes the use of the results of chemical effects testing.

No.	GL 2004-02 RAI Questions	GL 2004-02 RAI Responses
	Plant Environment Specific	
11	*Provide a detailed description of any testing that has been or will be performed as part of a plant-specific chemical effects assessment. Identify the vendor, if applicable, that will be performing the testing. Identify the environment (e.g., borated water at pH 9, deionized water, tap water) and test temperature for any plant-specific head loss or transport tests. Discuss how any differences between these test environments and your plant containment pool conditions could affect the behavior of chemical surrogates. Discuss the criteria that will be used to demonstrate that chemical surrogates produced for testing (e.g., head loss, flume) behave in a similar manner physically and chemically as in the ICET environment and plant containment pool environment.*	This information is provided in the response to Information Item 3.o.
12	*For your plant-specific environment, provide the maximum projected head loss resulting from chemical effects (a) within the first day following a LOCA, and (b) during the entire ECCS recirculation mission time. If the response to this question will be based on testing that is either planned or in progress, provide an estimated date for providing this information to the NRC.*	This information is provided in the response to Information Item 3.o.13.

No.	GL 2004-02 RAI Questions	GL 2004-02 RAI Responses
	ICET 1 and ICET 5 Plants	
13	*Results from the ICET #1 environment and the ICET #5 environment showed chemical products appeared to form as the test solution cooled from the constant 140°F° test temperature. Discuss how these results are being considered in your evaluation of chemical effects and downstream effects.*	The chemical effects testing described in the response to Information 3.o was performed at temperatures less than the expected CNP post-accident temperature. Information related to the ALION integrated chemical effects testing, and the downstream effects analysis results will be provided as given in the response to Information Item 2. As discussed in the response to RAI 6, CNP is not an ICET 5 plant. CNP is not a fiberglass insulation plant. An update to this RAI will not be provided since the only fiberglass debris at CNP is the assumed quantity of fiber from latent debris.
	Trisodium Phosphate (TSP Plants)	
14	*Not applicable*	
15	*Not applicable*	
16	*Not applicable.*	
	Additional Chemical Effects Questions	
17	*Not applicable.*	
18	*Not applicable.*	
19	*Not applicable.*	
20	*Not applicable.*	
21	*Not applicable.*	
22	*Not applicable.*	
23	*Not applicable.*	
24	*Not applicable.*	

No.	*GL 2004-02 RAI Questions*	GL 2004-02 RAI Responses
	Coatings	
	Generic - All Plants	
25	*Describe how your coatings assessment was used to identify degraded qualified/acceptable coatings and determine the amount of debris that will result from these coatings. This should include how the assessment technique(s) demonstrates that qualified/acceptable coatings remain in compliance with plant licensing requirements for design basis accident (DBA) performance. If current examination techniques cannot demonstrate the coatings' ability to meet plant licensing requirements for DBA performance, licensees should describe an augmented testing and inspection program that provides assurance that the qualified/acceptable coatings continue to meet DBA performance requirements. Alternately, assume all containment coatings fail and describe the potential for this debris to transport to the sump.*	The response to Information Item 3.h.7 describes the safety-related coatings program. The response to Information Items 3.h.5 and 3.h.6 describes the methodology and assumptions for determining the debris produced from the identified coatings. Tables 3h5-1 through 3h5-4 provide the amount of coating debris for the DEGB and the DGBS breaks. The response to Information Item Section 3.i describes the coatings assessment program and the changes that have been made to enhance that program.

No.	GL 2004-02 RAI Questions	GL 2004-02 RAI Responses
	Plant Specific	
26	*Provide test methodology and data used to support a zone of influence (ZOI) of 5.0 L/D. Provide justification regarding how the test conditions simulate or correlate to actual plant conditions and will ensure representative or conservative treatment in the amounts of coatings debris generated by the interaction of coatings and a two-phase jet. Identify all instances where the testing or specimens used deviate from actual plant conditions (i.e., irradiation of actual coatings vice samples, aging differences, etc.). Provide justification regarding how these deviations are accounted for with the test demonstrating the proposed ZOI.*	The information is provided in the response to Information Items 3.h.5 and 3.h.6.
27	*Not applicable.*	
28	*Not applicable.*	
29	*Not applicable.*	

No.	GL 2004-02 RAI Questions	GL 2004-02 RAI Responses
30	*The NRC staff's safety evaluation (SE) addresses two distinct scenarios for formation of a fiber bed on the sump screen surface. For a thin bed case, the SE states that all coatings debris should be treated as particulate and assumes 100% transport to the sump screen. For the case in which no thin bed is formed, the staff's SE states that the coatings debris should be sized based on plant-specific analyses for debris generated from within the ZOI and from outside the ZOI, or that a default chip size equivalent to the area of the sump screen openings should be used (Section 3.4.3.6). Describe how your coatings debris characteristics are modeled to account for your plant-specific fiber bed (i.e. thin bed or no thin bed). If your analysis considers both a thin bed and a non-thin bed case, discuss the coatings' debris characteristics assumed for each case. If your analysis deviates from the coatings' debris characteristics described in the staff-approved methodology, provide justification to support your assumptions.*	The information is provided in response to Information Items 3.f.4, 3.f.6, 3.h.3, and 3.h.4.
31	*Your submittal indicated that you plan to use a debris interceptor as a method to impede transport of debris to the ECCS sump screen. What is the amount (in either volume or percentage) of debris that is expected to be captured by the interceptor? Is there an evaluation for the potential to overload the debris interceptor?*	The response to Information Item 3.e.4 documents that DIs were not installed to specifically limit debris transport to either the main or remote strainers.

No.	GL 2004-02 RAI Questions	GL 2004-02 RAI Responses
32	*What structural analysis was performed on the debris interceptor design?*	The DI provided at the flood-up overflow wall was analyzed for dead load, seismic, hydrostatic, and hydrodynamic loading assuming it was fully blocked with debris, and the water temperature was at 236°F (which is significantly above the maximum expected temperature), per References 51 and 63.
33	*You indicated that you would be evaluating downstream effects in accordance with WCAP 16406-P. The NRC is currently involved in discussions with the Westinghouse Owner's Group (WOG) to address questions/concerns regarding this WCAP on a generic basis, and some of these discussions may resolve issues related to your particular station. The following issues have the potential for generic resolution; however, if a generic resolution cannot be obtained, plant-specific resolution will be required. As such, formal RAIs will not be issued on these topics at this time, but may be needed in the future. It is expected that your final evaluation response will specifically address those portions of the WCAP used, their applicability, and exceptions taken to the WCAP. For your information, topics under ongoing discussion include:*	Refer to the response to Information Items 3.m and 3.n. As tabulated in Attachment 7 to this letter, I&M has committed to provide the response to this information item following completion of the associated analysis.
33a	*a. Wear rates of pump-wetted materials and the effect of wear on component operation*	
33b	*b. Settling of debris in low flow areas downstream of the strainer or credit for filtering leading to a change in fluid composition*	
33c	*c. Volume of debris injected into the reactor vessel and core region*	
33d	*d. Debris types and properties*	

No.	GL 2004-02 RAI Questions	GL 2004-02 RAI Responses
33e	*e. Contribution of in-vessel velocity profile to the formation of a debris bed or clog*	
33f	*f. Fluid and metal component temperature impact*	
33g	*g. Gravitational and temperature gradients*	
33h	*h. Debris and boron precipitation effects*	
33i	*i. ECCS injection paths*	
33j	*j. Core bypass design features*	
33k	*k. Radiation and chemical considerations*	
33l	*l. Debris adhesion to solid surfaces*	
33m	*m. Thermodynamic properties of coolant*	
34	*Your response to GL 2004-02 question (d) (viii) indicated that an active strainer design will not be used, but does not mention any consideration of any other active approaches (i.e., backflushing). Was an active approach considered as a potential strategy or backup for addressing any issues?*	An active approach was not considered due to the complexity of design. Backflushing is not being credited for design basis mitigation capability. As described in the response in Section 3.f.4, testing was performed that sequentially reduced flow from 100% to 0%, and then restarted flow with subsequent increase back to 100%. The head loss plots provided in that section demonstrate the results of this flow sequencing.
35	*The licensee states that the final containment walkdowns for Unit 1 and Unit 2 will be completed in accordance with Nuclear Energy Institute (NEI) 02-01 during the fall 2006 and fall 2007 outages, respectively. The licensee also states that bounding analyses have already been completed in the areas of debris generation and transport. Please discuss the plans to incorporate the results of these future containment walkdowns into these analyses.*	The response to Information Item 3.d provides the response to this item.

No.	GL 2004-02 RAI Questions	GL 2004-02 RAI Responses
36	*The licensee states that testing to support other than 100% fines generation for calcium silicate (Cal-Sil) and Marinite insulation fragments will be completed in March 2006. Please provide a description of this test plan including purpose for this testing. The staff expects that the licensee will provide information to justify the plant-specific application for the Cal-Sil and Marinite debris size distribution that results from such testing.*	The Cal-Sil and Marinite size distribution, with the supporting justification is provided in the response to Information Item 3.b. Additional testing was performed to determine the maximum quantity of fines that would be generated from the spray, dissolution, and pool flow erosion of Cal-Sil and the pool flow erosion of Marinite pieces. This testing was performed by ALION and determined that a bounding quantity of 17% fines would be generated from Marinite pieces. This testing was performed with I&M supplied materials that were the same as those installed in CNP Unit 1 and Unit 2 containments. The basic methodology that was used for the testing was as follows: • The erosion tests were conducted at temperatures between 63°F (no flow tests) and up to 110°F (for flow and spray erosion tests) in reverse-osmosis treated water. • Dissolution tests were performed at 190°F +/- 5°F with 3000 ppm boron under five different sump chemistries. • Flow erosion testing was conducted at a flow velocity of 0.4 ft/s which was the measured incipient tumbling velocity of the samples (3 in by 3 in by 1 in Cal-Sil, and 3 in by 3 in by 1/2 in Marinite). • The spray flow for spray erosion testing was modeled on the CNP flow rates, nozzle size, and expected terminal velocity of the droplets. • The Marinite flow erosion testing determined that after 32 hours, the sample weight average loss was 1.18%. • The Cal-Sil flow erosion testing determined that for a 720 hour duration, the average weight loss was between 13.5% and 16.9%. • The dissolution tests for Cal-Sil resulted in a weight loss of between 1% and 5.5%. These values are bounded by the weight loss determined through the flow erosion testing.

No.	GL 2004-02 RAI Questions	GL 2004-02 RAI Responses
37	*Please discuss the treatment of LBLOCAs and small-break loss-of-coolant accident (SBLOCAs) in the debris generation analyses. The staff SE on the alternate evaluation methodology defines a "debris generation break size" which distinguishes between customary and realistic design-basis analyses. This methodology classifies all American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) Class 1 reactor coolant system (RCS) attached piping, and breaks in the RCS main loop piping equivalent to a double-ended guillotine break (DEGB) of a 14-inch schedule 160 pipe as being analyzed using design-basis analyses. The licensee identifies LBLOCAs as those greater than a 14-inch diameter pipe. It is not clear how the licensee is treating these breaks. For example, the DC Cook 14 inch diameter pressurizer surge line and 14 inch diameter residual heat removal (RHR) system cooldown pipe to RCS Loop No. 2 should be treated in a traditional design-basis analysis fashion. It is not clear that breaks in these lines were treated in this manner.*	A specific analysis for the generation of debris from a SBLOCA was not performed. The debris generation analysis, as described in the response to Information Item 3.b, determined the debris generated from a DEGB of the largest RCS pipe and the DGBS that was equivalent in area to the double-ended rupture of the largest pipe attached to the RCS piping (14 in). The results of these breaks are provided in the response to Information Item 3.b. The DGBS was treated as a LBLOCA. Both the DGBS and DEGB were treated in traditional design basis analysis manner. Refer to the response to Information Items 3.b, 3.e, 3.f, and 3.o for additional discussion of the treatment of these breaks.
38	*The licensee states that for materials which have no experimentally determined ZOI, a conservative assumption was made and the lowest available destruction pressure and ZOI were adopted (28.6 D). Please provide a listing of the materials for which this ZOI was applied and the technical reasoning for concluding this is conservative.*	The information on the applied ZOI radii is provided in the response to Information Item 3.b. The only material for which a ZOI radius could not be determined was assumed to fail, independent of a ZOI, in those areas where breaks that could lead to recirculation could occur. That material was the PVC jackets on flexible conduit.

No.	GL 2004-02 RAI Questions	GL 2004-02 RAI Responses
39	*It is not clear from the GL response how the alternate approach is being applied. Please provide a more detailed discussion of the approach taken. Is the proposed sump design based on the 14-inch debris generation break size or the limiting large-break case (Loop 4 cross-over break)?*	Refer to the "Conclusion" section of the response to Information Item 3 for the discussion on the application of the alternate evaluation methodology. The sump design was based on the limiting large break case.
40	*Please discuss any evaluations or considerations for exemption requests as a result of applying the Section 6 methodology. The NEI guidance report, "Pressurized Water Reactor Sump Performance Evaluation Methodology," NEI 04-07, and associated NRC staff SE recognized that exemptions from the regulations may be needed if this methodology was applied.*	I&M is not requesting exemptions as a result of applying the Alternate Break Methodology.
41	*The licensee acknowledges that use of the alternate evaluation methodology requires that mitigative capability be demonstrated for the Region II breaks (up through the DEGB of the largest RCS pipig). The staff expects that the licensee will provide information to demonstrate this mitigative capability in their updated GL response.*	The information is provided in the response to Information Items 3.b, 3.e, 3.f, 3.o, and the "Conclusion" section of the response to Information Item 3. Refer also to the information contained in References 11, 12, and 14.

No.	*GL 2004-02 RAI Questions*	GL 2004-02 RAI Responses
42	*The September 2005 response to GL 2004-02 appears to indicate that, while the replacement strainer would be submerged, it would also be continuously vented to the containment atmosphere. In this case, it is not clear to the staff whether a complete water seal would be preserved over the entire strainer surface if the head loss across the strainer were to exceed the vertical distance between the containment pool surface and the top of the vent pipe's connection to the strainer. The September 2005 response stated that the maximum predicted head loss would be 8.17 ft (which was identified as possibly being overly conservative), and that analyzed containment water levels during the first 10 hours following an accident were identified as being in the range of 5.9 - 7.5 ft. Thus, it appears possible that, as a result of head loss across the suction strainer debris bed, the water level in the vent line could be drawn down to the point of uncovering a portion of the strainer surface. Without a complete water seal over its surface, the replacement strainer would no longer appear to meet the definition of a "fully submerged" sump in Appendix A to Regulatory Guide 1.82, Revision 3. Therefore, the NRC staff requests that the licensee provide further information concerning whether the potential exists for vent uncovery to break the water seal across the strainer surface. If this phenomenon is credible, please additionally state the criteria used to evaluate sump failure for this case.*	This information is provided in the response to Information Item 3.f.11.

No.	GL 2004-02 RAI Questions	GL 2004-02 RAI Responses
43	*Has debris settling upstream of the sump strainer (i.e., the near-field effect) been credited or will it be credited in testing used to support the sizing or analytical design basis of the proposed replacement strainers? In the case that settling was credited for either of these purposes, estimate the fraction of debris that settled and describe the analyses that were performed to correlate the scaled flow conditions and any surrogate debris in the test flume with the actual flow conditions and debris types in the plant's containment pool.*	The information is provided in the response to Information Items 3.f.12 and 3.o.1. I&M is not crediting near-field settling of debris upstream of the strainers.
44	*What is the minimum strainer submergence during the postulated LOCA? At the time that the re-circulation starts, most of the strainer surface is expected to be clean, and the strainer surface close to the pump suction line may experience higher fluid flow than the rest of the strainer. Has any analysis been done to evaluate the possibility of vortex formation close to the pump suction line and possible air ingestion into the ECCS pumps? In addition, has any analysis or test been performed to evaluate the possible accumulation of buoyant debris on top of the strainer, which may cause the formation of an air flow path directly through the strainer surface and reduce the effectiveness of the strainer?*	The information is provided in the response to Information Items 3.f.1, 3.f.2, 3.f.3, and 3.j. Due to the design of the strainers at CNP, there is not an entrance path for water or air on top of the strainers. Buoyant debris on top of the remote strainer would not create a flow path for air into the strainer due to the solid top plate on the strainer.

ATTACHMENT 7 TO AEP:NRC:8054-02

REGULATORY COMMITMENTS

The following table identifies those actions committed to by I&M in this letter. Any other actions discussed in this submittal represent intended or planned actions by I&M. They are described to the NRC for the NRC's information and are not regulatory commitments.

Commitment	Date
I&M will modify the insulation on the NESW lines inside the crane wall below the SG enclosures such that the foam insulation (Rubatex) is double jacketed without moisture barrier backing. (Response to Information Items 3.b.3 and 3.i.1)	Prior to Unit 1 entry into Mode 4 at the end of the Spring 2008 RFO.
I&M will provide the results of cold galvanizing compound testing at K&L PPG in the final response to GL 2004-02. (Response to Information Item 3.b.3)	Within 90 days of completion of all actions needed to address GL 2004-02.
I&M will complete removal of labels, tags, signs, tape, and similar materials to the extent practical in Unit 1, and will collect data for unqualified labels in Unit 1. (Response to Information Items 3.b.1, 3.b.5 and 3.d.4)	Prior to Unit 1 entry into Mode 4 at the end of the Spring 2008 RFO.
I&M will provide an update to this table (Table 3b5-1 Bounding Quantity of Debris Available to Transport That Can Reduce Effective Strainer Area) with updated unit-specific values in the final response to GL 2004-02. (Response to Information Items 3.b.5 and 3.d.4)	Within 90 days of completion of all actions needed to address GL 2004-02.
I&M will report on the analysis of water samples collected at selected points during the large scale strainer testing in the final response to GL 2004-02. (Response to Information Item 3.f.4)	Within 90 days of completion of all actions needed to address GL 2004-02.
I&M will perform sampling of latent debris in containment when major work activities that could result in the generation of significant quantities of latent debris are performed, e.g., SG replacement. (Response to Information Item 3.i.1)	Ongoing
In accordance with CNP procedures, commencing with the Unit 2 Spring 2009 RFO, and for every Unit 1 and Unit 2 RFO thereafter, an assessment of containment debris sources will be completed. (Response to Information Item 3.i.1)	Ongoing

Commitment	Date
I&M will maintain the necessary programmatic and process controls, such as those described in the response to Information Item 3.i.2, to ensure the ECCS and CTS recirculation functions are maintained in accordance with the applicable regulatory requirements identified in GL 2004-02. (Response to Information Item 3.i.2)	Ongoing
I&M is continuing to evaluate station programs and processes to ensure the necessary controls to prevent the introduction of foreign material into containment will be in place prior to implementation of the new mechanistic design and licensing basis requirements that support resolution of GL 2004-02. I&M will implement any additional changes identified as necessary. (Response to Information Item 3.i.2)	May 31, 2008
The evaluations of downstream effects within pumps, the reactor vessel, and the reactor core will be completed. (Response to Information Items 3.m.1 and 3.n.1)	May 31, 2008
The results of the downstream effects analysis, including any design or operational changes, will be provided in the final response to GL 2004-02. (Response to Information Items 3.m.2, 3.m.3, 3.n.1, 3.o.1, and 3.o.2)	Within 90 days of completion of all actions needed to address GL 2004-02.
I&M will provide the final determination of the impact of chemical effects on strainer head loss considering the CCI testing and ALION testing in the final response to GL 2004-02. (Response to Information Items 3.o, 3.o.1, 3.o.14.a) and 3.o.14.b))	Within 90 days of completion of all actions needed to address GL 2004-02.
UFSAR Section 7.8 will be revised for Unit 1 following implementation of associated TS changes. (Response to Information Item 3.p)	Prior to Unit 1 entry into Mode 4 at the end of the Spring 2008 RFO.
I&M will change the licensing basis to reflect the mechanistic evaluation of the effect of post accident debris on the ECCS and CTS recirculation function. (Response to Information Item 3.p)	May 31, 2008

Commitment	Date
The changes to UFSAR Section 6.2, Section 6.3, Figure 6.2-1A, and Figure 9.3-1 to reflect installation of a new remote strainer in Unit 1 will be made effective. (Response to Information Item 3.p)	Prior to Unit 1 entry into Mode 4 at the end of the Spring 2008 RFO.
I&M will provide an update to the calculated NPSH margins following completion of analysis associated with determination of head loss across the strainer, including chemical effects. (Response to Information Item 3.g.16)	Within 90 days of completion of all actions needed to address GL 2004-02.