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May 2, 2001

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555-0001

SUBJECT: Oconee Nuclear Station - Unit 2
Docket No. 50-270
Request for Authorization to Use Alloy 690 Welding
Filler Material Per Code Cases 2142-1 and 2143-1 in
accordance with 10 CFR 50.55a(a) (3) (i)

Pursuant to 10 CFR 50.55a(a) (3) (i), Duke Energy Corporation (DEC) requests the NRC to authorize the use of Alloy 690 welding filler material along with the associated ASME Boiler and Pressure Vessel Code, Section IX, Code Cases 2142-1 and 2143-1. These code cases would be applied as an alternative to the ASME Boiler and Pressure Vessel Code, Section XI, 1992 Edition with no addenda for Oconee Unit 2.

This request is to allow the application of Alloy 690 type weld filler material (Alloy 52/152) for the repair of Control Rod Drive Mechanism (CRDM) nozzles on the Oconee Unit 2 Reactor Vessel head. Industry studies show that Alloy 690 weld filler materials possess a high resistance to primary water corrosion. DEC has evaluated and determined that the alternative material will provide an acceptable level of quality and safety, when compared to the materials allowed by the referenced code, because of its superior corrosion resistant properties.

The NRC has previously approved the use of Alloy 52/152 for DEC applications. Specifically, DEC received approval on; 1) September 10, 1999 to apply Alloy 690 (and the associated Code Cases) to the Oconee replacement steam generators (TAC Nos. MA6209, MA6210, and MA6211), 2) January 8, 2001 to apply Alloy 690 (and the associated Code Cases) for Unit 1 reactor vessel head weld repairs (TAC No. MB0854), and 3) April 13, 2001 to apply Alloy 690 (and the associated Code Cases) for Unit 3 reactor vessel head weld repairs (TAC No. MB1319).

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A detailed description of this proposed alternative, including a background discussion and justification is included as Attachment A to this letter. Use of this alternative weld material is scheduled to start on May 7, 2001. Entry into Mode 2 is presently scheduled for May 24, 2001.

Attachment A to this request contains information proprietary to Framatome ANP (FRA ANP). The proprietary information is enclosed by brackets "[]". An affidavit from FRA ANP is included as Attachment B. This affidavit sets forth the basis on which the information may be withheld from public disclosure by the NRC pursuant to 10 CFR 2.790. Attachment C provides a non-proprietary version of this request.

Questions regarding this request may be directed to Robert Douglas at (864) 885-3073.

Very truly yours,



William R. McCollum

Attachments:

- A - Request for Alternative, Serial Number 01-05
(Proprietary)
- B - Affidavit of R. W. Ganthner
- C - Request for Alternative, Serial Number 01-05 (Non-Proprietary)

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xc w/att:

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xc(w/o attch):

M. E. Shannon,
NRC Senior Resident Inspector
Oconee Nuclear Station

Mr. Virgil Autrey
Division of Radioactive Waste Management
Bureau of Land and Waste Management
SC Dept. of Health & Environmental Control
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R. C. Douglas
S. C. Newman
C. T. Smith (ANII)
ISI Relief Request File
NRIA File/ELL EC050

ATTACHMENT B

DUKE ENERGY CORPORATION
RELIEF REQUEST 01-05

AFFIDAVIT OF

R. W. Ganthner

AFFIDAVIT OF RAYMOND W. GANTHNER

- A. My name is Raymond W. Ganthner. I am Vice-President of Engineering & Licensing for Framatome ANP, Inc. (FRA-ANP), and as such, I am authorized to execute this Affidavit.
- B. I am familiar with the criteria applied by FRA-ANP to determine whether certain information of FRA-ANP is proprietary and I am familiar with the procedures established within FRA-ANP to ensure the proper application of these criteria.
- C. In determining whether an FRA-ANP document is to be classified as proprietary information, an initial determination is made by the Unit Manager, who is responsible for originating the document, as to whether it falls within the criteria set forth in Paragraph D hereof. If the information falls within any one of these criteria, it is classified as proprietary by the originating Unit Manager. This initial determination is reviewed by the cognizant Section Manager. If the document is designated as proprietary, it is reviewed again by me to assure that the regulatory requirements of 10 CFR Section 2.790 are met.
- D. The following information is provided to demonstrate that the provisions of 10 CFR Section 2.790 of the Commission's regulations have been considered:
- (i) The information has been held in confidence by FRA-ANP. Copies of the document are clearly identified as proprietary. In addition, whenever FRA-ANP transmits the information to a customer, customer's agent, potential customer or regulatory agency, the transmittal requests the recipient to hold the information as proprietary. Also, in order to strictly limit any potential or actual customer's use of proprietary information, the substance of the following provision is included in all agreements entered into by FRA-ANP, and an equivalent version of the proprietary provision is included in all of FRA-ANP's proposals:

AFFIDAVIT OF RAYMOND W. GANTHNER (Cont'd.)

"Any proprietary information concerning Company's or its Supplier's products or manufacturing processes which is so designated by Company or its Suppliers and disclosed to Purchaser incident to the performance of such contract shall remain the property of Company or its Suppliers and is disclosed in confidence, and Purchaser shall not publish or otherwise disclose it to others without the written approval of Company, and no rights, implied or otherwise, are granted to produce or have produced any products or to practice or cause to be practiced any manufacturing processes covered thereby.

Notwithstanding the above, Purchaser may provide the NRC or any other regulatory agency with any such proprietary information as the NRC or such other agency may require; provided, however, that Purchaser shall first give Company written notice of such proposed disclosure and Company shall have the right to amend such proprietary information so as to make it non-proprietary. In the event that Company cannot amend such proprietary information, Purchaser shall prior to disclosing such information, use its best efforts to obtain a commitment from NRC or such other agency to have such information withheld from public inspection.

Company shall be given the right to participate in pursuit of such confidential treatment."

AFFIDAVIT OF RAYMOND W. GANTHNER (Cont'd.)

- (ii) The following criteria are customarily applied by FRA-ANP in a rational decision process to determine whether the information should be classified as proprietary. Information may be classified as proprietary if one or more of the following criteria are met:
- a. Information reveals cost or price information, commercial strategies, production capabilities, or budget levels of FRA-ANP, its customers or suppliers.
 - b. The information reveals data or material concerning FRA-ANP research or development plans or programs of present or potential competitive advantage to FRA-ANP.
 - c. The use of the information by a competitor would decrease his expenditures, in time or resources, in designing, producing or marketing a similar product.
 - d. The information consists of test data or other similar data concerning a process, method or component, the application of which results in a competitive advantage to FRA-ANP.
 - e. The information reveals special aspects of a process, method, component or the like, the exclusive use of which results in a competitive advantage to FRA-ANP.
 - f. The information contains ideas for which patent protection may be sought.

AFFIDAVIT OF RAYMOND W. GANTHNER (Cont'd.)

The document(s) listed on Exhibit "A", which is attached hereto and made a part hereof, has been evaluated in accordance with normal FRA-ANP procedures with respect to classification and has been found to contain information which falls within one or more of the criteria enumerated above. Exhibit "B", which is attached hereto and made a part hereof, specifically identifies the criteria applicable to the document(s) listed in Exhibit "A".

- (iii) The document(s) listed in Exhibit "A", which has been made available to the United States Nuclear Regulatory Commission was made available in confidence with a request that the document(s) and the information contained therein be withheld from public disclosure.
- (iv) The information is not available in the open literature and to the best of our knowledge is not known by General Electric, Westinghouse-CE, or other current or potential domestic or foreign competitors of FRA-ANP.
- (v) Specific information with regard to whether public disclosure of the information is likely to cause harm to the competitive position of FRA-ANP, taking into account the value of the information to FRA-ANP; the amount of effort or money expended by FRA-ANP developing the information; and the ease or difficulty with which the information could be properly duplicated by others is given in Exhibit "B".

E. I have personally reviewed the document(s) listed on Exhibit "A" and have found that it is considered proprietary by FRA-ANP because it contains information which falls within one or more of the criteria enumerated in Paragraph D, and it is information which is customarily held in confidence and protected as proprietary information by FRA-ANP. This report

AFFIDAVIT OF RAYMOND W. GANTHNER (Cont'd.)

comprises information utilized by FRA-ANP in its business which affords FRA-ANP an opportunity to obtain a competitive advantage over those who may wish to know or use the information contained in the document(s).



RAYMOND W. GANTHNER

State of Virginia)

) SS. Lynchburg

City of Lynchburg)

Raymond W. Ganthner, being duly sworn, on his oath deposes and says that he is the person who subscribed his name to the foregoing statement, and that the matters and facts set forth in the statement are true.



RAYMOND W. GANTHNER

Subscribed and sworn before me
this 2nd day of May 2001.



Notary Public in and for the City
of Lynchburg, State of Virginia.

*el was commissioned a notary public
as Brenda C. Cardona,*

My Commission Expires July 31, 2003

EXHIBITS A& B

EXHIBIT A

Request for Alternate No. 01-05, Duke Energy Corporation, Oconee Nuclear Station, Unit 2.

EXHIBIT B

The above listed document contains information, which is considered Proprietary in accordance with Criteria b, c, d, e, and f of the attached affidavit.

DUKE ENERGY CORPORATION
Oconee Nuclear Station, Unit 2

Request for Alternative Material than approved by the
ASME Boiler and Pressure Vessel Code, Section XI

Applicable Code Edition and Addenda

ASME Boiler and Pressure Vessel Code, Section XI, 1992
Edition with no addenda.

**Description of Code Requirement(s) for Which an Alternative
is Requested**

The Code to be utilized for the repairs to the CRDM nozzles described in this request is the 1992 ASME Code Section XI with no addenda. The 1992 code allows, by reference, the use of Alloy 600 based weld filler material (Alloy 82/182) but does not include the use of Alloy 690 based weld filler material (Alloy 52/152).

Code cases 2142-1 and 2143-1 introduce and classify new nickel based weld metals that closely match Alloy 690. Code Case 2142-1 establishes welding classifications and other requirements for bare wire filler metal (UNS N06052 Ni-Cr-Fe). Code Case 2143-1 establishes welding classifications and other requirements for a coated electrode (UNS W86152 Ni-Cr-Fe). These two Code cases have not been incorporated by reference into the regulations; therefore, their use requires NRC approval.

Description of Proposed Alternative

In lieu of the requirements of the 1992 code, the use of Alloy 690 weld filler material is proposed for the repair of CRDM nozzles located on the Oconee Unit 2 Reactor Vessel (RV) head. At present, use of this filler material is needed for CRDM Nos. 4, 6, 18, and 30².

² Should the relief requested herein be needed for other CRDM nozzles, a letter supplementing this request will identify these nozzles.

In addition, DEC requests the use of ASME Code Cases 2142-1 and 2143-1 that group the new weld filler material in the same welding category as other commonly employed nickel based weld filler metals. This allows the use of appropriate existing welding procedures and performance qualifications with the new weld metals.

Justification for Using the Proposed Alternative

Industry studies have demonstrated that Alloy 690 weld materials possess a high resistance to primary water corrosion. The use of Alloy 690 has been previously approved for other applications at Ocone.

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There is potential for weld dilution of the proposed Alloy 690 material during the welding operations that will join the shortened nozzles to the RV head. An evaluation of possible weld dilution concluded that the percentage of chromium in the new pressure boundary welds will exceed 22%. Materials with chromium concentrations above 22% have demonstrated resistance to Primary Water Stress Corrosion Cracking (PWSCC). In summary, the chromium content of the new pressure boundary welds containing the proposed Alloy 690 material, considering chromium dilution, will exceed that of the original Alloy 600 material, and thus afford superior corrosion resistance.

Background Information

Repairs to the subject CRDM nozzles and welds are required because of the discovery of small amounts of boron at the

subject nozzles during a normal visual inspection of the RV head following a shutdown of the reactor in preparation for refueling outage 2EOC18. This pressure boundary degradation was reported to the NRC on April 28, 2001 in accordance with 10CFR50.72(b)(3)(ii).

Non-destructive examinations utilizing eddy current and ultrasonic methods are planned for the nozzle base metal of the subject nozzles. Liquid penetrant inspections are also planned for each J groove partial penetration weld connecting these CRDM nozzles to the inside radius of the RV head. These inspections will help identify the probable leak path.

Experience gained from the repairs to the Unit 1 and Unit 3 CRDM nozzles indicated that more automated repair methods were needed to reduce radiation dose to repair personnel. So for the Unit 2 repairs, a semi-automated repair method is planned for each of the subject nozzles. [

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The Quality and Safety Provided by the Proposed Alternative

Alloy 690 material has been shown to be superior to Alloy 600 material in resisting Primary Water Stress Corrosion Cracking (PWSCC). In a letter to the NRC dated August 6,

1999, DEC requested authorization to use the Alloy 690 material in the construction of the replacement steam generators to be installed at Oconee starting in 2003. The NRC approved the request by letter dated September 10, 1999. Similarly, the NRC has authorized the use of Alloy 690 material in the construction of replacement steam generators for McGuire Nuclear Station Units 1 & 2, and Catawba Nuclear Station Unit 1. The NRC also approved requests by letters dated January 8, 2001, and April 13, 2001 respectively for use of Alloy 690 material in the repairs of the Oconee Unit 1 thermocouple and CRDM nozzles, and the Unit 3 CRDM nozzles.

ASME Code Cases 2142-1 and 2143-1 establishes the uniform chemical and material properties and the classification of the weld material with respect to its welding characteristics. Code Case 2142-1 establishes the F-No. for the American Welding Society (AWS) specification AWS A5.14 and Unified Numbering System (UNS) designation UNSN06052 (Alloy 52) as F-No. 43 for both procedure and performance qualification purposes. Code Case 2143-1 establishes the F-No. for AWS A5.11 and UNS designation W86152 (Alloy 152) for a coated electrode as F-No. 43 for welding purposes. These sets of specifications and F-No. assignments completely describe this material for welding purposes as similar in their welding characteristics to other Code approved nickel based weld metals.

In conclusion, the use of Alloy 690 welding filler material (Alloy 52/152) and the associated ASME Code Cases 2142-1 and 2143-1 for the repairs to Oconee Unit 2 CRDM nozzles will provide superior corrosion protection over that provided by Alloy 600 (Alloy 82/182) material. A detailed analysis of the specific application has produced acceptable results. The use of Alloy 690 has been previously authorized for new construction and other repair activities. Therefore, the proposed alternative provides an acceptable level of quality and safety.

Duration of the Proposed Alternative

The proposed alternative applies only to the repairs to the subject Oconee Unit 2 Reactor Vessel head CRDM nozzles.

Originated By: Timothy D. Brown 5/2/01
Timothy D. Brown Date

Reviewed By: L. J. Azzarello 5/2/01
Leonard J. Azzarello Date

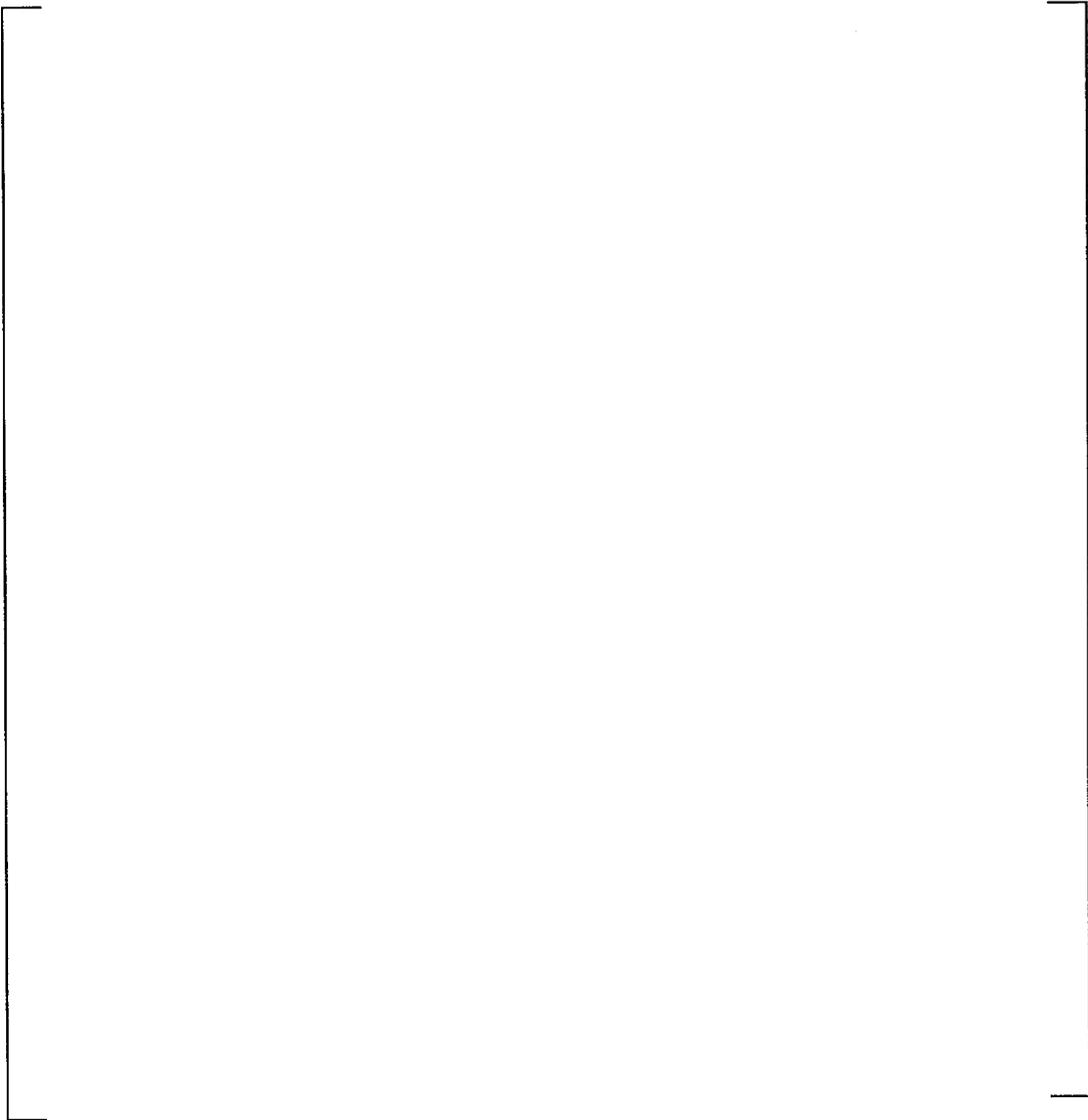


Figure 1: Roll Expansion of CRDM Nozzle

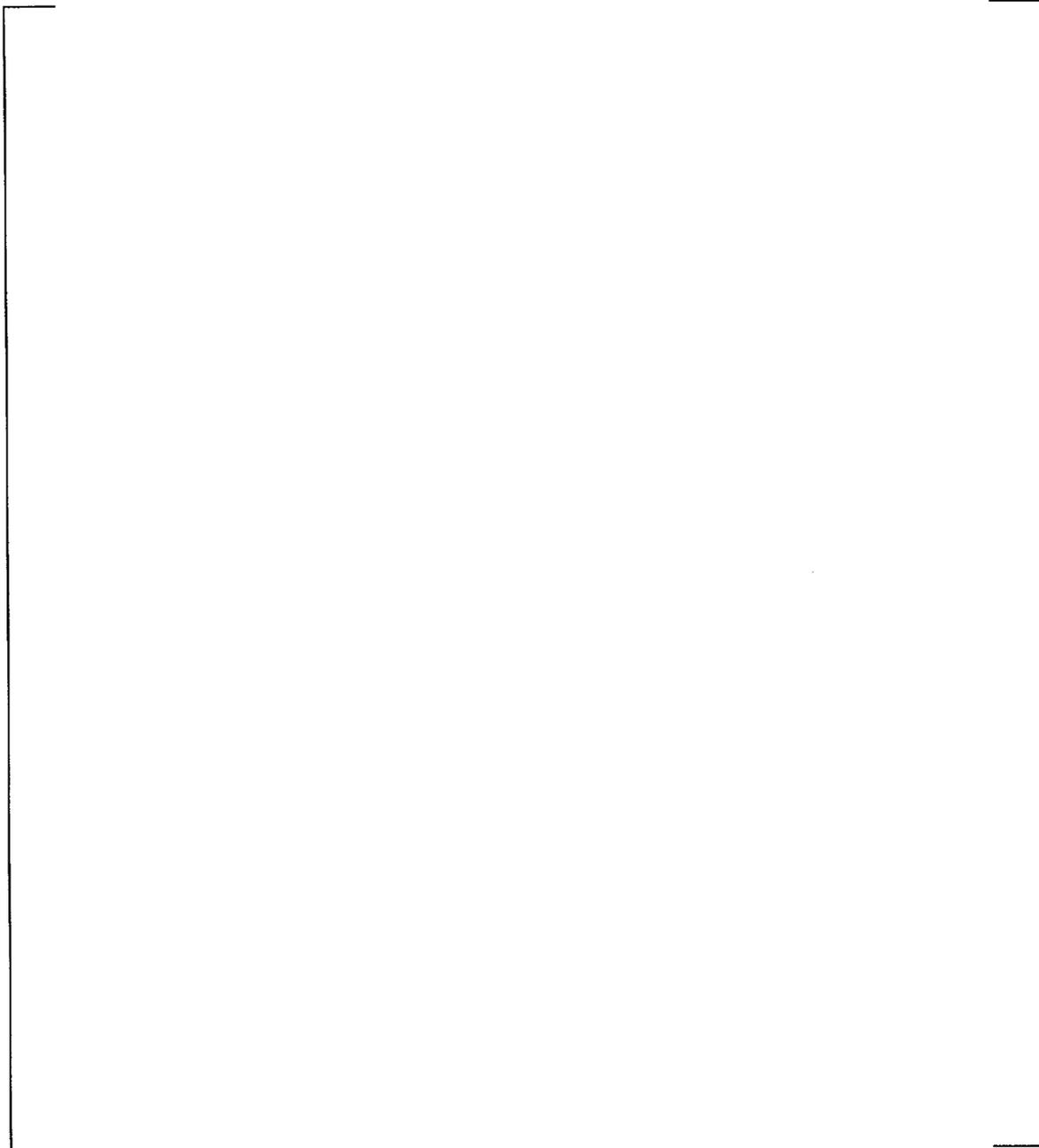


Figure 2: Remote CRDM Nozzle Removal and Weld Prep Machining

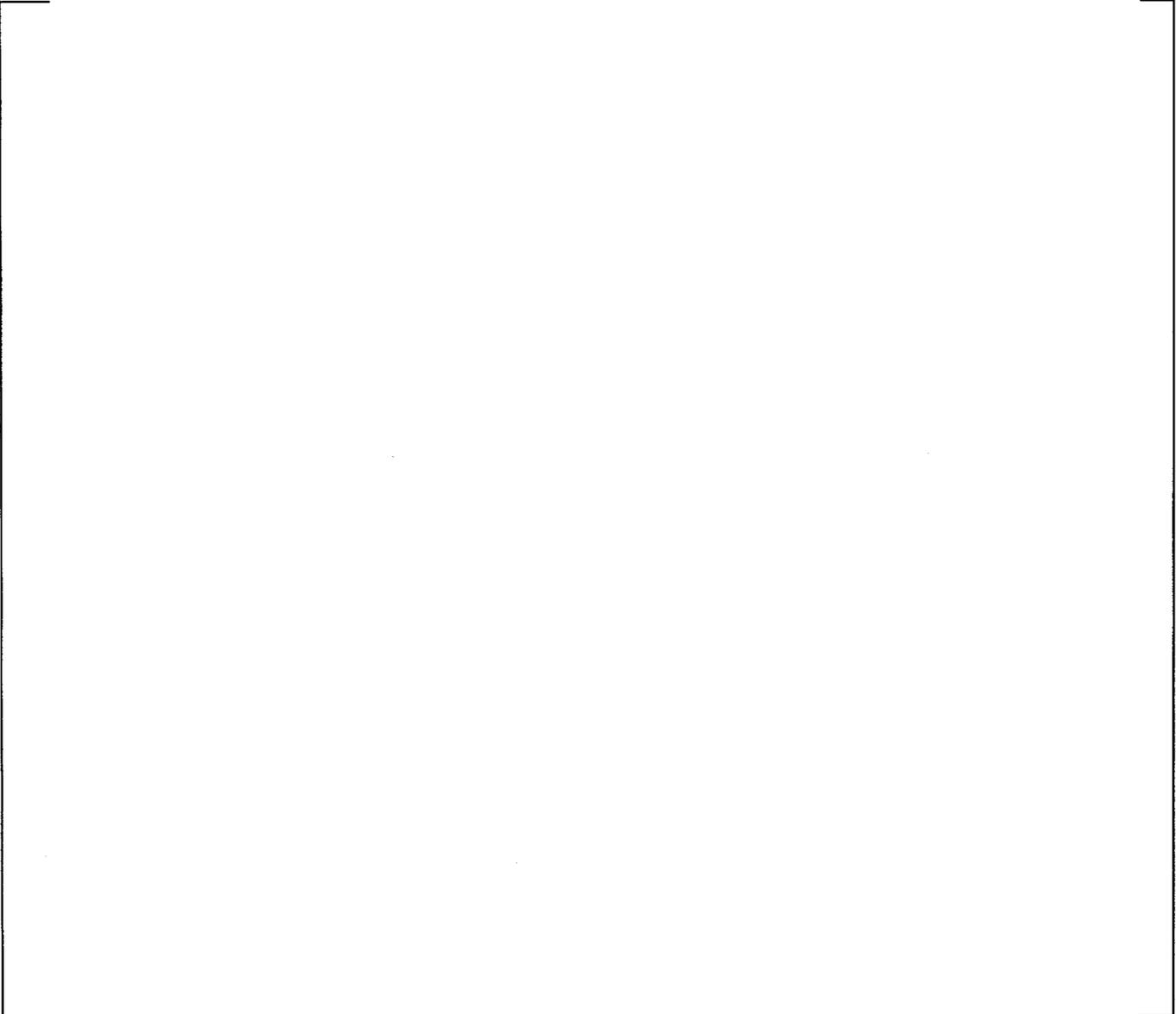


Figure 3: Remote Welding Operations