NMC
Committed to Nuclear Excellence

Monticello Nuclear Generating Plant
Operated by Nuclear Management Company, LLC

May 30, 2001

U S Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

MONTICELLO NUCLEAR GENERATING PLANT
Docket No. 50-263 License No. DPR-22

Supplemental Information for
Request for Relief No. 12 for the Third 10-Year
Interval Inservice Inspection Program

Reference 1: NSP letter to NRC, "Request for Relief No. 12 for the Third 10-Year Interval Inservice Inspection Program," dated October 10, 2000.

Reference 2: NSP letter to NRC, "Response to NRC Request for Additional Information for Request for Relief No. 12 for the Third 10-YearInterval Inservice Inspection Program," dated May 3, 2001.

In Reference 1, Nuclear Management Company (NMC) requested approval of Inservice Inspection (ISI) Relief Request No. 12 to the third 10-year plan for the Monticello Nuclear Generating Plant.

In Reference 2, NMC responded to NRC requests for additional information. On May 10, 2001, a conference call was held between NMC and NRC in which the NRC staff requested clarification on the issue of reactor pressure vessel (RPV) fluence values. Specifically, the NRC staff requested additional justification for the fluence values assumed for the Monticello RPV, and documentation that these values were conservative. Additional justification is hereby provided in Attachment 1. Attachment 1 discusses results of an NRC funded study (Letter report to W. Norris, NRC, dated April 26, 2000) in which "scrapping samples" were removed from the Monticello RPV. Attachment 1 provides a summary of the program results for Monticello.

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Additionally, Attachment 2 includes drawings of the Monticello RPV and discusses the significance of those drawings with respect to the samples taken.

Please direct any questions on this matter to Sam Shirey, Sr. Licensing Engineer, at (763) 295-1449.

for Jeff Forbes

Jeff Forbes
Plant Manager
Monticello Nuclear Generating Plant

C: Regional Administrator-III, NRC
NRR Project Manager, NRC
Sr. Resident Inspector, NRC
Minnesota Department of Commerce
J Silberg, Esq.

Attachments 1: Larry Greenwood Letter to Mr. Thomas R. Crippes, NMC, "Retrospective Neutron Dosimetry for the Monticello Nuclear Generating Plant" May 21, 2001

2. Discussion of Attached Drawings.

Pacific Northwest National Laboratory

Operated by Battelle for the
U.S. Department of Energy

May 21, 2001

Mr. Thomas R. Crippes
Xcel Energy
2807 W. County Rd. 75
Monticello, MN 55362

Subject: Retrospective Neutron Dosimetry for the Monticello Nuclear Generating Plant

Dear Mr. Crippes:

In April 2000, we reported the results of some retrospective dosimetry measurements at four jet pump riser brace pad positions in the Monticello reactor. These measurements were part of a program funded by the Nuclear Regulatory Commission. (Letter report to W. Norris, NRC, dated April 26, 2000.) The retrospective neutron dosimetry technique uses scrapings from the jet pump riser brace pads themselves to determine the neutron exposure rather than relying on a prepared dosimetry capsule, such as is used for the pressure vessel surveillance dosimetry. Both methods calculate the neutron fluences from the measured activation rate corrected for the reactor power history and divided by the spectral averaged neutron activation cross section. (See ASTM E 261-90, Standard Test Method for Determining Neutron Fluence Rate, Fluence, and Spectra by Radioactivation Techniques, as well as many associated ASTM standards for various reactions and techniques.)

A surveillance dosimetry capsule was analyzed in 1984 and the results are documented in a Battelle Columbus Laboratory report BCL-585-84-2, Revision 1. We have compared the results of our new measurements with the results in the BCL report. Taking into account the power history differences, the fast neutron fluxes that we determined in our measurements in 2000 are in reasonable agreement with the results in the BCL report for the 30° position, assuming that the azimuthal fast neutron flux has a repeating 45° symmetry around the beltline of the reactor.

The BCL report presents the results of calculations of the azimuthal fast neutron flux, predicting that the maximum flux should be located at about the 0° position. The BCL report then uses this calculated azimuthal flux difference to predict the maximum or bounding flux condition for the reactor. We also performed retrospective dosimetry measurements at azimuthal positions of 90° and 270°, which should be comparable to the 0° position detailed in the BCL report of 1984, assuming a repeating 45° symmetry. Our measurements at 124° and 304° give a fast flux (> 1 MeV) of 1.18 and 0.86 x 10^9 n/cm^2/s at the jet pump riser brace pad positions, only slightly lower than the BCL value of 1.22 x 10^9 n/cm^2-s at the surveillance capsule position behind the jet pump. However, our measurements at 94° and 274° both give a flux value of 1.49 x 10^9 n/cm^2-s, an increase of only a

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factor of 1.3 to 1.7 over the 30° position, compared to the BCL prediction of about a factor of 4 increase between the 0° and 30° positions. (For comparison purposes, all fluxes are quoted at 1670 MWt, the original nominal operating power of the reactor, rather than the current operating power level of 1775 MWt.) The most likely explanation for the lower fluxes and flattening of the azimuthal flux dependence seen in our measurements compared to the BCL report is due to the changes to the core edge fuel loading, which started after the BCL measurements and calculations.

Since our measurements in 2000 are in reasonable agreement with those reported in 1984 at the 30° position and since our maximum flux measurements are lower than those calculated in the 1984 report at the 0° position, we can conclude that a linear extrapolation of the maximum flux calculated in the 1984 report based on the reactor power history will certainly represent an upper bounding limit on the neutron fluences calculated for the Monticello pressure vessel. It should further be pointed out that the fuel redistribution started in 1984 significantly reduced the core edge bundle flux peaking factors resulting in a significant reduction in the neutron fluences at the reactor pressure vessel locations. Since a linear extrapolation of the neutron fluences in the 1984 BCL report does not take credit for this flux reduction, this adds an additional degree of conservatism to the pressure vessel bounding fluence calculations.

If further questions arise about these measurements and calculations, please don't hesitate to contact me.

Sincerely,

L. R. Greenwood

Lawrence R. Greenwood, Ph.D
Senior Staff Scientist

Discussion of Attached Drawings

The following discussion pertains to drawings for the Monticello Nuclear Generating Plants reactor pressure vessel (RPV). The discussion is intended to explain the orientation of the original vessel sample specimen baskets, and the locations of the samples taken during the 1999 refueling outage.

Reference 1: Monticello Nuclear Generating Station RF-19, January 2000, In-Vessel Visual Inspection Final Report.

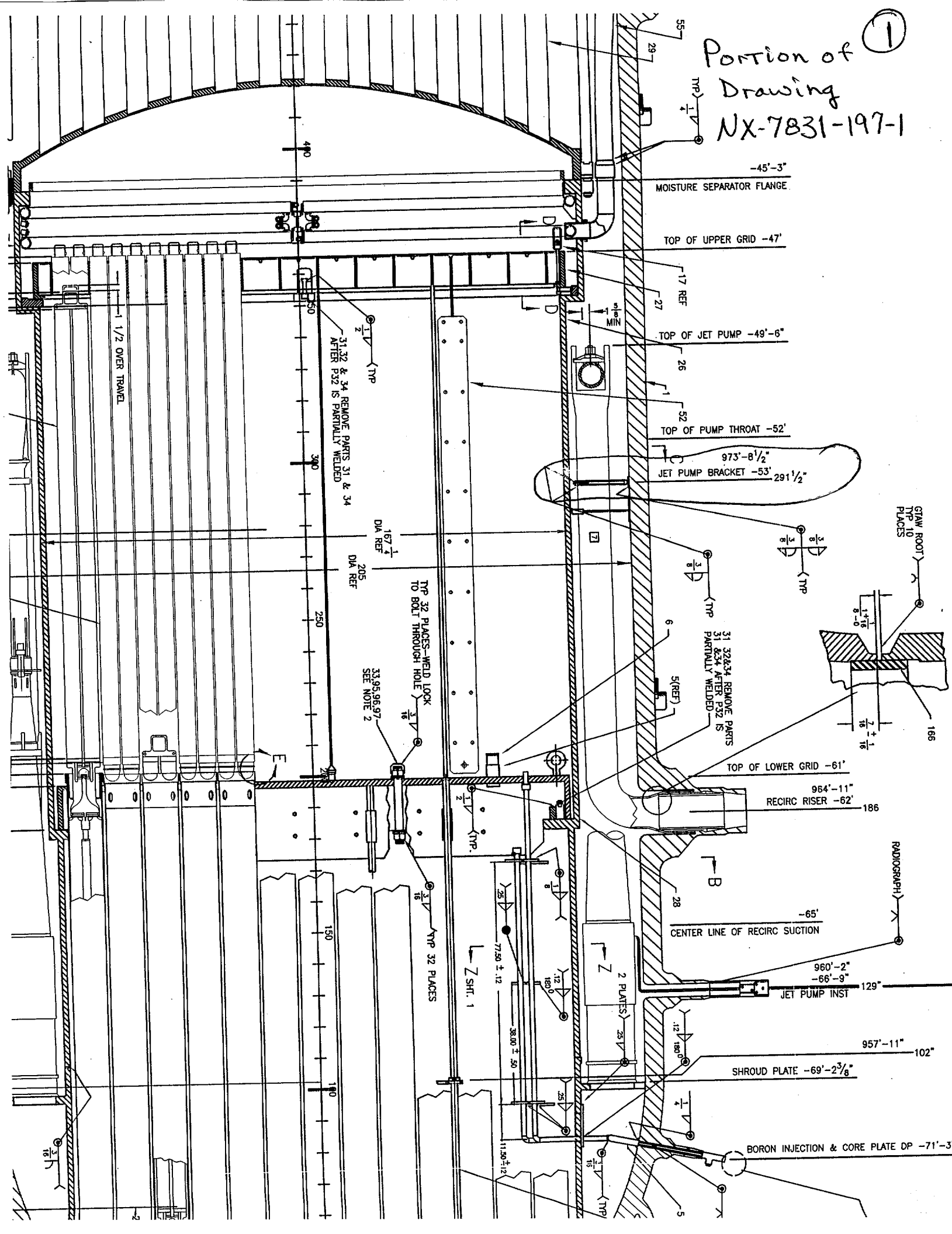
1) NX-7831-197-1: Monticello Nuclear Generating Plant Reactor Vessel & Internals (Portion only)
This cross section view of the reactor vessel shows location of major vessel internals and attachments including the jet pump riser braces at elevation 291 ½".

2) MT-9200 from Reference 1: Specimen Holder
This side view shows original surveillance mounting in relation to vessel wall. Note 30°, 120°, and 300° stated locations.

3) MT-3000 from Reference 1: Jet Pump Isometric – Inside View
This isometric drawing shows the configuration of the jet pump assembly and riser braces. The right upper pad is where samples were taken during the 1999 refueling outage.

4) Figure 3 – Proposed As-Left Riser Brace Pad Configuration
This figure identifies the approximate location where the sample was taken with respect to the pad configuration.

5) No Drawing No: Riser Brace Pad Sampling – As Left Condition
Top view of RPV showing radial location of jet pumps and locations of samples taken during the 1999 refueling outage. Photographs are of actual as-left sample points.


Portion of Drawing NX-7831-197-1
-45'-3"
MOISTURE SEPARATOR FLANGE
TOP OF UPPER GRID -47'
17 REF
TOP OF JET PUMP -49'-6"
TOP OF PUMP THROAT -52'
973'-8½"
JET PUMP BRACKET -53'
291½"
1 1/2 OVER TRAVEL
31,32 & 34 REMOVE PARTS AFTER P32 IS PARTIALLY WELDED
167¼ DIA REF
205 DIA REF
TYP 32 PLACES-WELD LOCK TO BOLT THROUGH HOLE
33,95,96,97 SEE NOTE 2
31 32&34 REMOVE PARTS 31 &34 AFTER P32 IS PARTIALLY WELDED
GTAW ROOT TYP 10 PLACES
TOP OF LOWER GRID -61'
964'-11"
RECIRC RISER -62'
186
-65'
CENTER LINE OF RECIRC SUCTION
960'-2"
-66'-9"
129"
JET PUMP INST
957'-11"
102"
SHROUD PLATE -69'-2⅜"
BORON INJECTION & CORE PLATE DP -71'-3
2 PLATES
SHT. 1
TYP 32 PLACES
RADIOGRAPH
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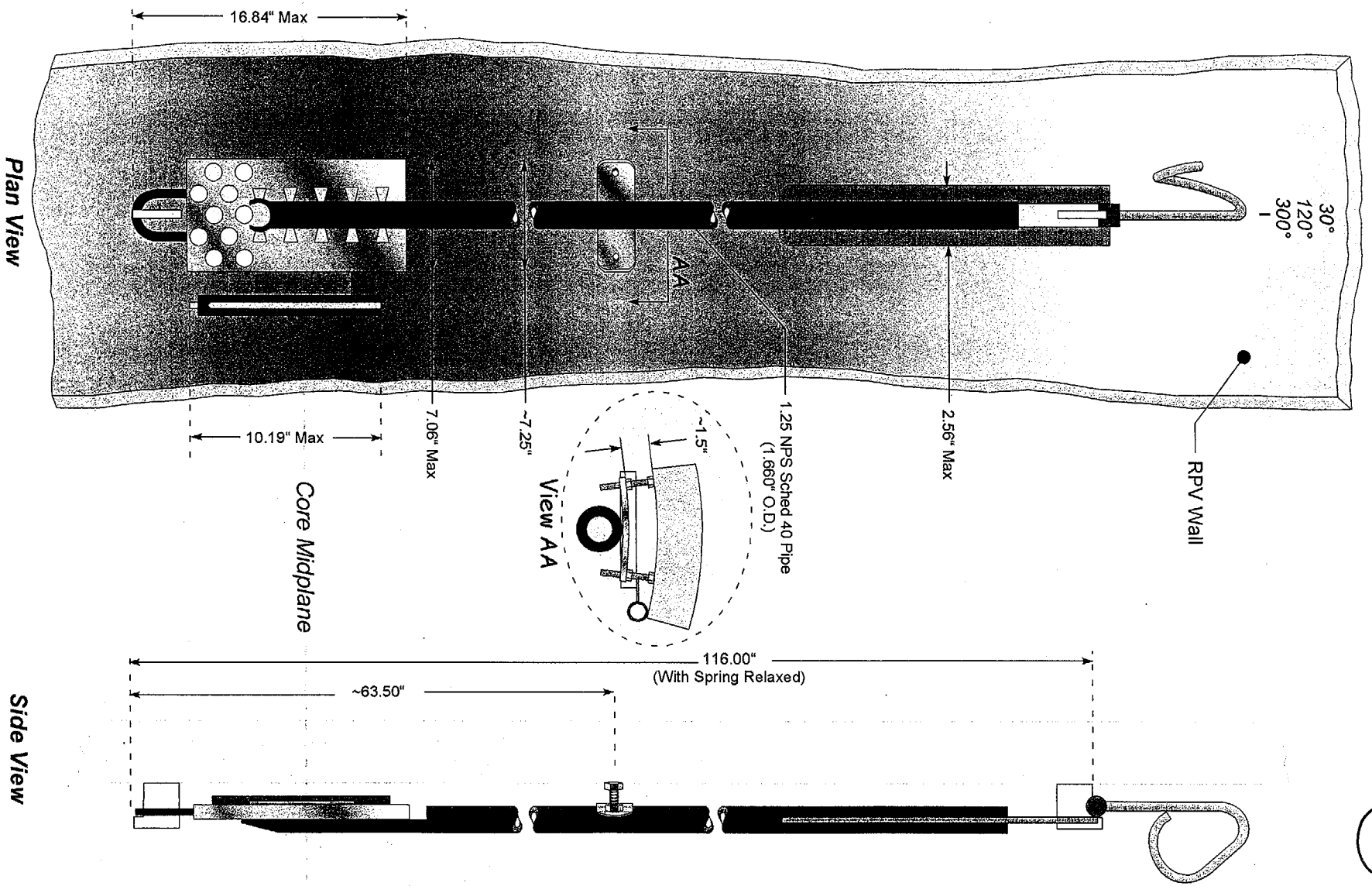
FRAMATOME TECHNOLOGIES

Specimen Holder



NOTES:	PROJECT:	PREPARED BY:	TITLE:	SKETCH NO.
This Sketch Is FTI Proprietary And For Illustration Only Not To Be Used For Fabrication Or Installation	*Monticello*	*Framatome Technologies December, 1999*	*SPECIMEN HOLDER*	*MT-9200 - Rev 0*

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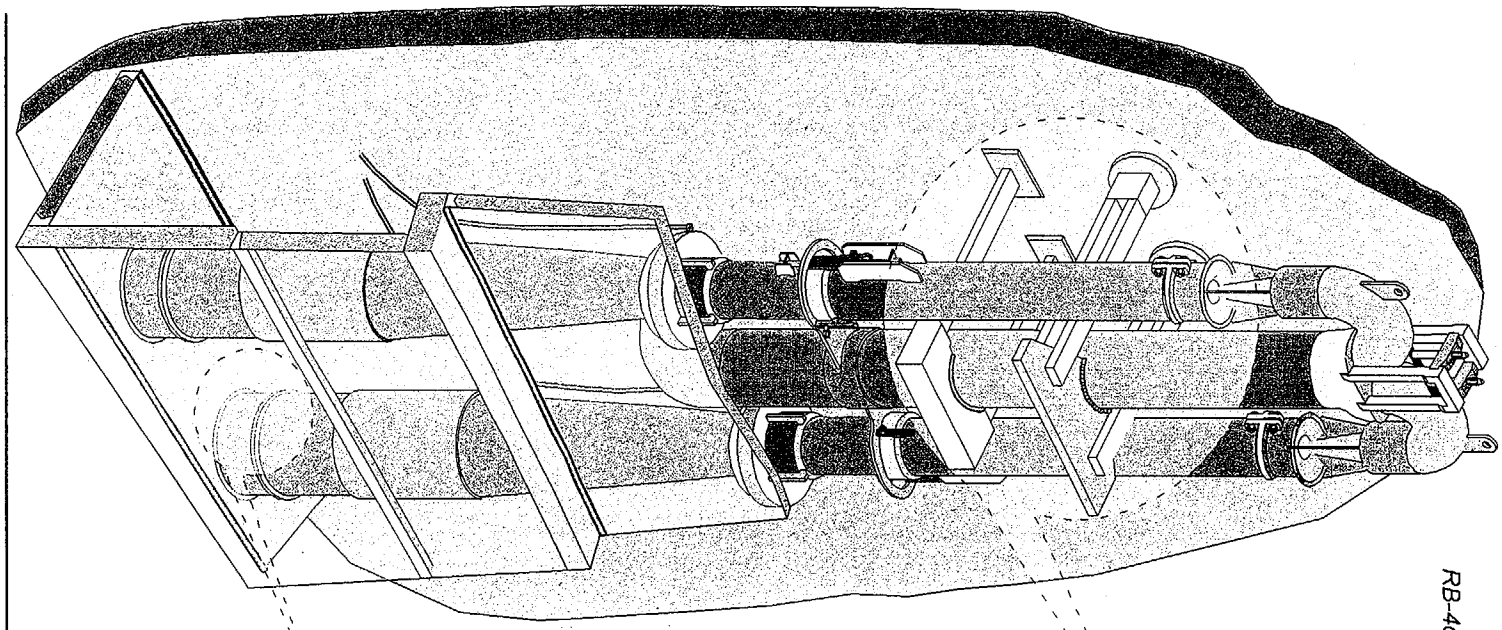
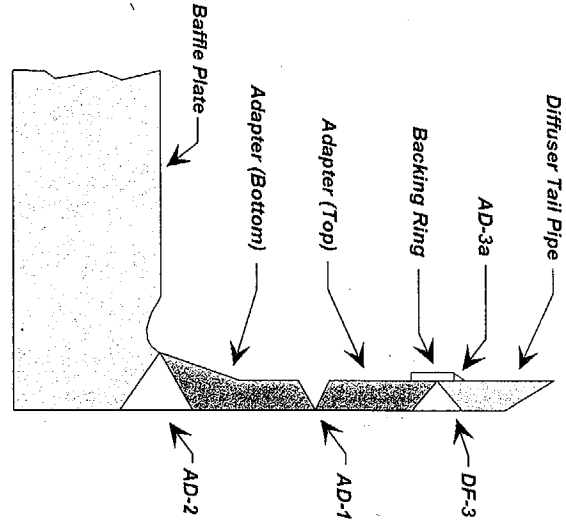
FRAMATOME TECHNOLOGIES

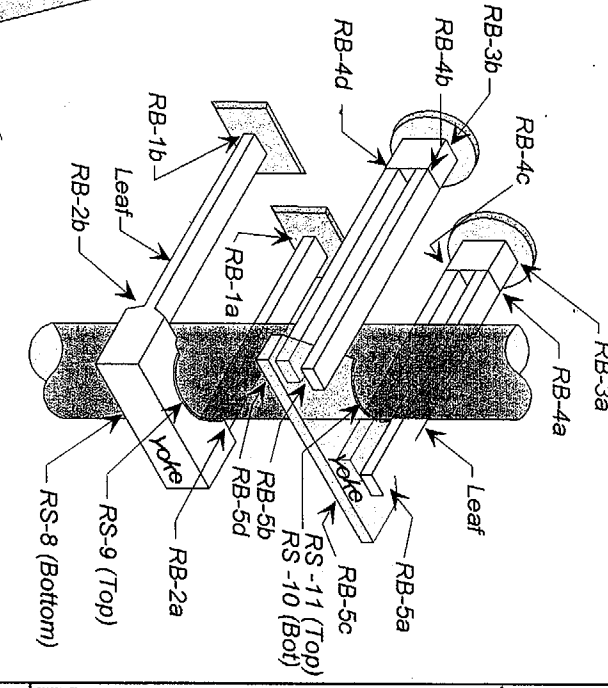
Jet Pump Isometric - Inside View





Straight Adapter Assembly

Riser Braces
Double Brace Design



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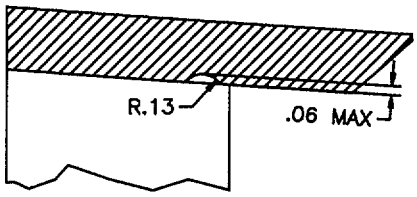
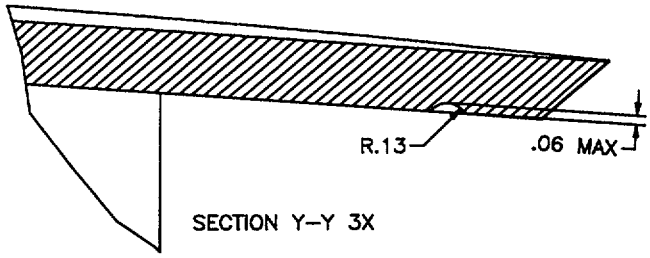
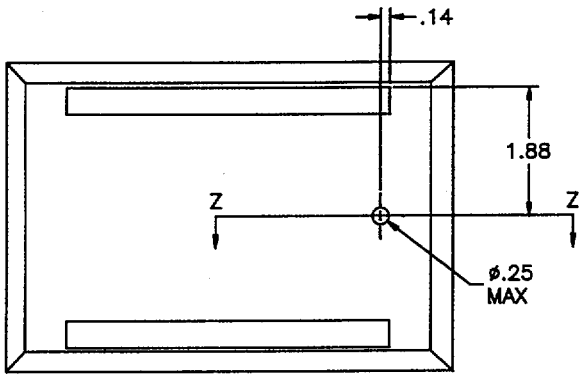
NOTES:	PROJECT:	PREPARED BY:	TITLE:	SKETCH NO.
This Sketch Is FTI Proprietary And For Illustration Only Not To Be Used For Fabrication Or Installation	**Monticello**	*Framatome Technologies November, 1999*	*JET PUMP ISOMETRIC - INSIDE VIEW*	*MT-3000 - Rev 1*



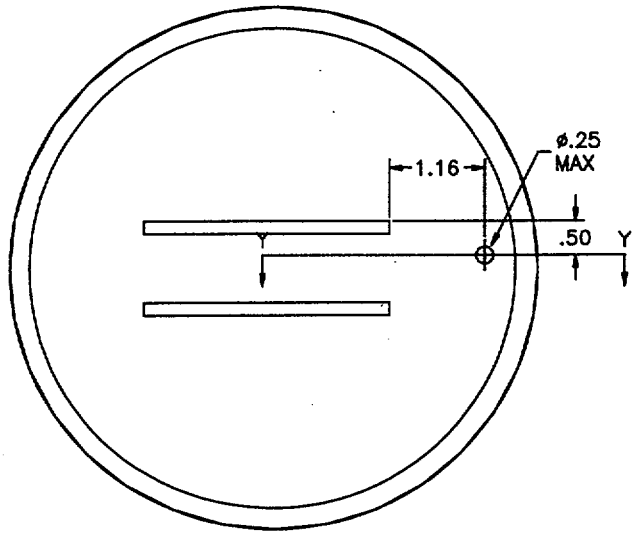
SECTION Z–Z 3X



SECTION Y–Y 3X



TYPICAL CONFIGURATION
FOR HATCH & RIVERBEND



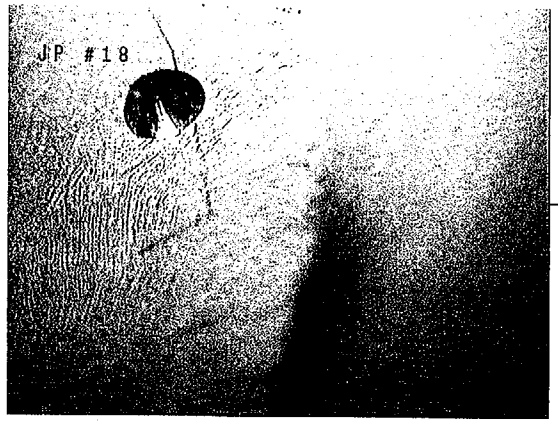
TYPICAL CONFIGURATION
FOR MONTICELLO

Figure 3 – Proposed As-Left Riser Brace Pad Configuration

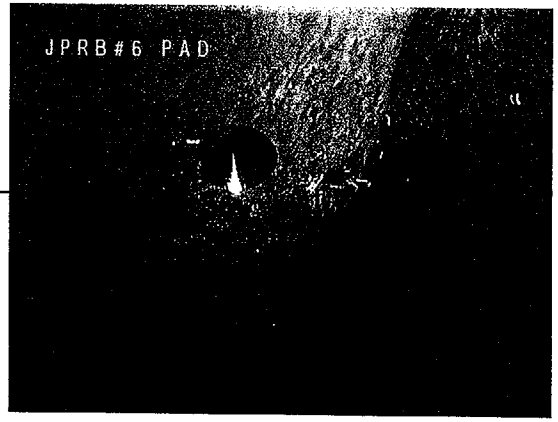
FRAMATOME TECHNOLOGIES

Monticello RF1? Outage

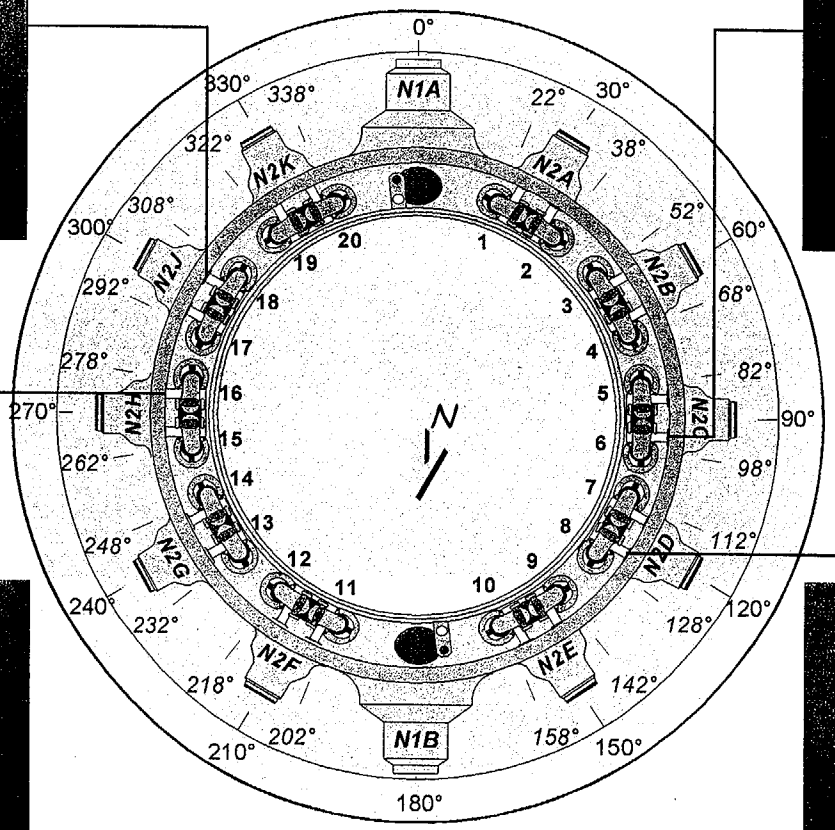
Riser Brace Pad Sampling - As-Left Condition



Jet Pump #18 Riser Brace Pad As-Left Condition



Jet Pump #6 Riser Brace Pad As-Left Condition



Jet Pump #16 Riser Brace Pad As-Left Condition

Jet Pump #8 Riser Brace Pad As-Left Condition

NOTES:	PROJECT:	PREPARED BY:
These Photograhs Depict the As-Left Condition of the Riser Brace Pads After Taking Samples	***Monticello Jet Pump Riser Brace Pad Sampling***	***Framatome Technologies*** *January 2000*

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