VENDOR'S DOCUMENT REVIEW

FORMAT: DATA COLLECTION ONLY

1	X	Approved ~~Mfg. may proceed~~ JJF
2		Approved Sumit final doc't. Mfg. may proceed
3		Approved except as noted Make changes and submit final doc't. Mfg. may proceed as approved
4		Not approved Correct and resubmit
5		Review not required Mfg. may proceed

Approval of this document does not relieve supplier from full compliance with contract or purchase order requirements.

By John J. Ferraro Date 5/26/93

ROCHESTER GAS & ELECTRIC CORP.
ROCHESTER, N.Y.

SENSING SYSTEMS CORPORATION
TRANSDUCERS AND SERVICES

R.E. GINNA NUCLEAR POWER PLANT

RADIAL DISPLACEMENT AND REBAR STRAIN MEASUREMENTS FOR EWR #5181 Revision A

TECHNICAL REPORT 50016-7

May 17, 1993

	CONSTRUCTION	
	LIMITED CONSTRUCTION : AS NOTED	
	PRELIMINARY NOT FOR CONSTRUCTION	
	BIDDING PURPOSES	
5/26/93	HISTORICAL REFERENCE	
DATE	RELEASED FOR	ENGR

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R.E. GINNA NUCLEAR POWER PLANT

RADIAL DISPLACEMENT AND REBAR STRAIN MEASUREMENTS FOR EWR #5181 Revision A

TECHNICAL REPORT 50016-7

May 17, 1993

Written By:

Ricardo J. Bermudez

Approved By:

LaVerne F. Wallace

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1.0 INTRODUCTION

Sensing Systems Corporation was contracted by Rochester Gas & Electric Corporation (RG&E) under Purchase Order No. CP-49467-C-RD to conduct radial displacement measurements at the R.E. Ginna Nuclear Power Plant in Ontario, New York. Test preparations and measurements were conducted during the period from March 31 to April 15, 1993.

In addition to the radial displacement measurements, rebar strain gage measurements were added to the scope of the work prior to start of the test.

Radial displacement measurements and strain gage measurements were conducted during the first Integrated Leak Rate Test (ILRT) pressurization-depressurization cycle. These measurements were obtained at pressure plateaus of 0, 15, 35 and 0 psig. In addition, strain gage measurements and radial displacements at two locations were obtained at 25 psig.

This report describes the procedures followed before and during the tests and the results of the data acquisition program. Documentation provided by RG&E regarding the ILRT may be found in Appendix A.

2.0 INSTRUMENTATION

The response of the Containment Building were measured during the first ILRT pressurization-depressurization cycle by the following methods:

a. Measurement of displacements.

b. Measurement of rebar strain.

Two distinct sets of equipment were setup to acquire the desired data. This section describes the equipment and the configurations used for effecting radial displacement and strain gage measurements.

2.1 Sensor Instrumentation and Installation Techniques:

All sensors and instrumentation were installed in accordance with the locations stipulated in RG&E's Bid Specification CE-165, Rev 0, 9/25/92. This document may be found in Appendix A.

2.1.1 Optical Tooling Scales:

Optical scales and jig transits were used to measure cylinder wall radial displacement. Optical tooling scales were mounted by RG&E personnel directly to the containment building at the prescribed locations. The scales were positioned to be perpendicular to the wall surface and to the jig transit line of sight. Two fixed reference targets were used for each of the three optical scale azimuths to establish the plane to which the radial growth was referenced.

2.1.2 Scale Locations:

Three sets of four displacement measuring scales were located at three azimuth locations around the Containment Building as follows:

Elevation	Azimuth
260'-0"	40°42', 166°07', 260°00'
288'-0"	40°42', 166°07', 260°00'
315'-0"	40°42', 166°07', 260°00'
337'-0"	40°42', 166°07', 260°00'

2.1.3 Jig Transit Locations:

Each Jig Transit was positioned on top of a tripod by using A 3.5-8 inch adaptor. Each Jig Transit was located at one of the prescribed azimuth locations as follows:

40°42' Azimuth Location: The Jig Transit was positioned above penetration number I-90H-P located in the Intermediate Building (North) Basement Floor Level, elevation 253'8".

166°07' Azimuth Location: The Jig Transit was positioned above penetration number A-57-P located in the Auxiliary Building Operating Floor Level, elevation 271'0".

260°00' Azimuth Location: The Jig Transit was positioned above penetration number I-16-P located in the Intermediate Building (West) Basement Floor Level, elevation 253'6".

2.1.4 Target Locations:

Two targets were installed at each Azimuth location to establish a reference plane. Their locations were as follows:

40°42′ Azimuth Location: The two targets were located in a vertical plane at right angles to the 40°42′ radial line and 7.25 inches from the containment surface. The first and primary target was placed on an existing bracket attached to a steel column northwest of the transit position and at a sight distance of 72 inches. The second target was placed on the inside surface of the east wall of the intermediate building and at a sight distance of 38 inches.

166°07′ Azimuth Location: The first target was located on the vertical concrete wall between the Auxiliary Building Operating Floor level and the fuel transfer pool. It was located approximately 30 ft. from the transit, 8 ft. from the containment wall and 7 ft. above the jig transit floor level.
The second target was located directly below the 260′-0" scale on the next floor level and on the same azimuth (166°07′) line as the scales and the Jig Transit.

260°00′ Azimuth Location: The first target was located on a unistrut member approximately 15 ft. from the Jig Transit, 3 ft. from the containment wall and 1 in. above the floor.
The second target was placed on a concrete base approximately 30 ft. from the Jig Transit, 10 ft. from the Containment Wall and 3 in. above the floor.

2.1.5 Rebar Strain Gages:

The original 1969 rebar strain gages and cables were in place prior to the start of the current test. A visual inspection and electrical check-out program was conducted prior to the test to determine and select fully operational strain gages. Eight rebar strain gage installations were selected for monitoring during the test based on the results of the inspection program. Four rebar were selected from the equipment hatch locations, two were selected from the dome area and two from the cylinder wall area.

The rebars were originally (1969) instrumented with two tee strain gages wired into a full Wheatstone bridge. The gages were equally spaced on the circumference of the rebar to indicate average strain. The function of the lateral gages was to compensate for temperature effects and to provide additional bridge sensitivity proportional to Poisson's ratio.

Additional cable lengths were spliced to all strain gage channels and routed to the outside equipment hatch enclosure. This permitted all rebar strain gages to be read from the same location.

2.1.6 Rebar Strain Gage Locations:

The exact location of each rebar strain gage is detailed below. The same location number used in the original report is also used in this document for direct comparison of stress values. The letter V denotes the Vertical or Meridional direction and the H denotes the Horizontal or Hoop direction. All dome and cylinder wall rebars were vertical bars.

Location No.	Elevation	Notes
31V	281'7⅛"	16 ft. (CCW direction) from Equipment Access Opening along horizontal axis.
31H	281'7⅛"	Same as above.
32V	281'7⅛"	21 ft. (CCW direction) from Equipment Access Opening along horizontal axis.
32H	281'7⅛"	Same as above.
42	336'2"	Cylinder Wall, Azimuth 30°.
49	342'2"	Cylinder Wall, Azimuth 150°.
54	346'8"	Dome Junction, Azimuth 30°.
58	350'2"	Dome Junction, Azimuth 150°.

2.2 Recording Instrumentation:

2.2.1 Jig Transits:

The wall radial growth data were recorded using two K&E and one Brunson Jig Transits with optical micrometers. Data were recorded by first leveling the instrument, aligning the instrument with the ground reference targets and then sighting the individual scales. Scale data were taken by reading the inches and tenths of inches from the scale graduations. Hundredths and thousandths of an inch were reads using the optical micrometer. A total of 3-5 readings were recorded over a 10-20 minute period of time while re-checking the instrument setup. The average of all readings was recorded on the data sheet.

2.2.2 Rebar Strain Gages:

All Rebar Strain Gage data were recorded by individually connecting each channel to a Vishay P-3500 digital strain indicator. Each reading was monitored for approximately 30 seconds to one minute to determine their stability prior to recording its value.

3.0 TEST

3.1 Test Procedure:

3.1.1 General:

The radial displacement and rebar strain measurements were performed in conjunction with the 1993 Outage Integrated Leak Rate Test. Two different pressurization-depressurization cycles were necessary for the successful completion of the ILRT. All measurements reported in this document were performed during the first pressurization-depressurization cycle.

3.1.2 Preparations:

All test personnel were on site several days prior to the start of the test. Checks were made and daily readings were taken by the test personnel to insure that all instruments and equipment required for the test were installed and operating satisfactorily.

3.1.3 Zero Pressure:

Test personnel acquired data at zero psig for a period of five days prior to the start of the test. The data were evaluated for consistency and accuracy. The last zero psig data prior to the start of the test were taken 15 minutes prior to starting the first pressurization-depressurization cycle.

3.1.4 Pressurization and Depressurization:

Test data were recorded after pressurization was increased to each test pressure level and held for a period of approximately one hour to allow time for obtaining the measurements. Radial displacement and rebar strain measurements were taken in this manner at 0, 15, 35 and 0 psig. Additional radial displacement readings (at two locations only) and rebar strain readings were taken at 25 psig and 26 psig respectively. The two locations for which displacement data were obtained at 25 psig were the 40°42′ and 166°07′ azimuths. The additional readings were taken without the one hour hold.

3.2 Data Reduction and Analysis:

3.2.1 Optical Data:

Radial displacement growth at each scale has been determined from the jig transit readings by subtracting the scale reading recorded at 0 psig from the readings taken at each of the test pressure levels.

3.2.2 Rebar Strain Gage Data:

The rebar strain data at each location has been determined from the P-3500 readings by subtracting the value recorded at 0 psig from the readings taken at each of the test pressure levels. Rebar stress values in pounds per square inch (psi) have been calculated from the strain data and using a Poissons ratio of 0.30 and a modulus of elasticity of 30×10^6 psi.

4.0 RESULTS

All results are presented in the form of tables or figures. Radial Growth values versus Pressure are presented in Table I whereas Rebar Stress values versus Pressure are shown in Table II. Graphical representations of Radial Displacement versus Containment Building Elevation are shown on Figures 1 through 3. Raw data may be found in Appendix B.

TABLE I. Radial Growth Versus Pressure.

Azimuth	Pressure (psig)	Elevation			
		260′	288′	315′	337′
40°42′	15	0.032	0.040	0.049	0.041
	25	0.073	0.097	0.119	0.068
	35	0.117	0.150	0.184	0.106
	0	-0.002	0.000	0.006	0.003
166°07′	15	0.037	0.051	0.047	0.015
	25	0.099	0.124	0.112	0.040
	35	0.158	0.191	0.174	0.070
	0	0.002	-0.002	-0.003	-0.010
260°00′	15	0.031	0.035	0.019	0.005
	35	0.144	0.140	0.124	0.045
	0	-0.003	-0.001	-0.003	-0.005

TABLE II. Rebar Stress Versus Pressure.

Rebar Location	Rebar Stress (psi)			
	Pressure			
	15 (psi)	26 (psi)	35 (psi)	0 (psi)
31V	750	1030	1320	30
31H	620	770	1280	-30
32V	1110	1800	2560	210
32H	1820	3920	6880	10
49	-	-	-	-
54	890	1100	1520	-700
58	1030	1750	2000	100

NOTES: 1. Rebar Stress Values Calculated Based on $E = 30 \times 10^6$ psi and $\mu = 0.30$.
2. Measurements on Rebar Location 49 were drifting during monitoring period.

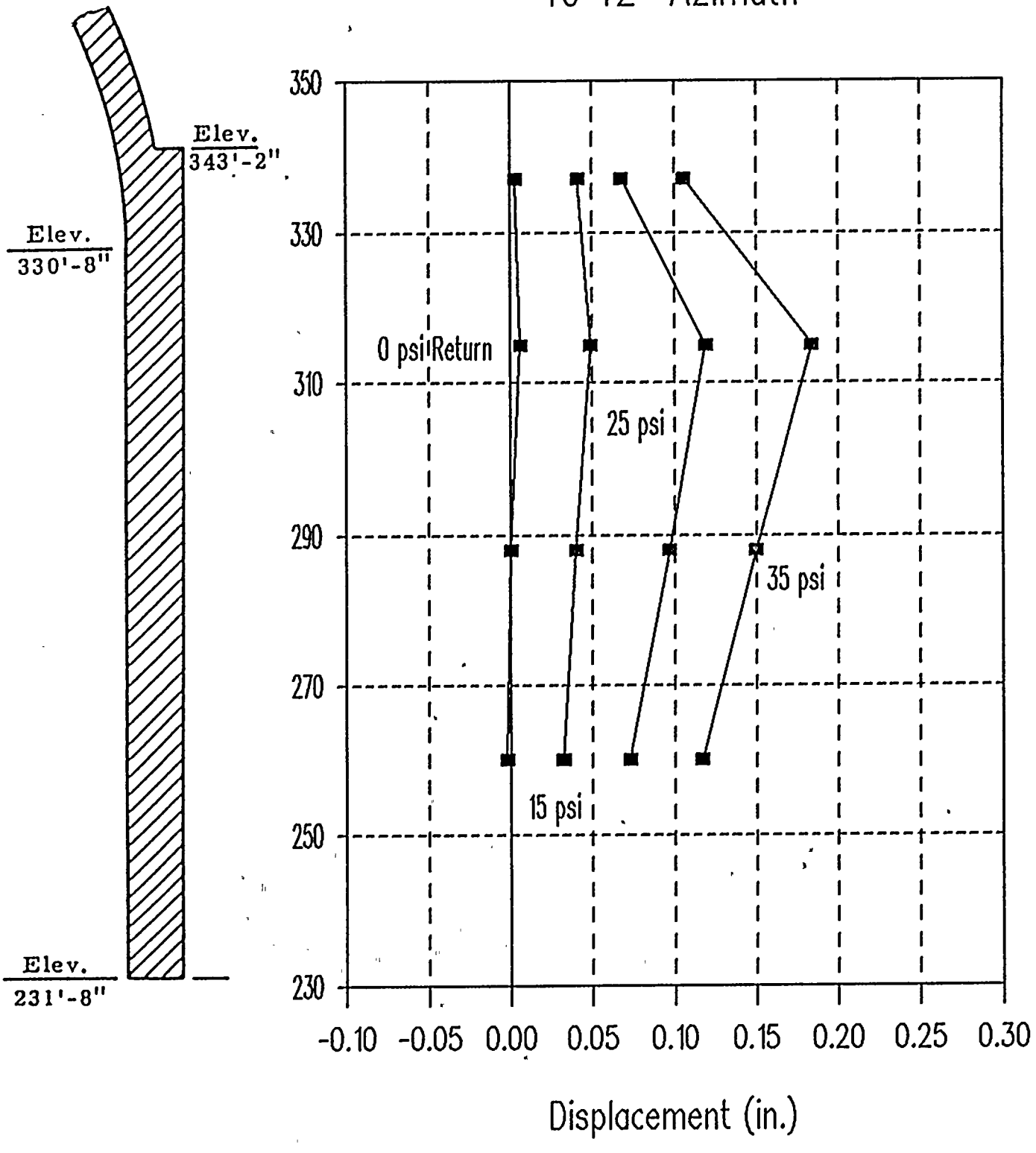

Figure 1. Radial Disp. Vs. Elevation

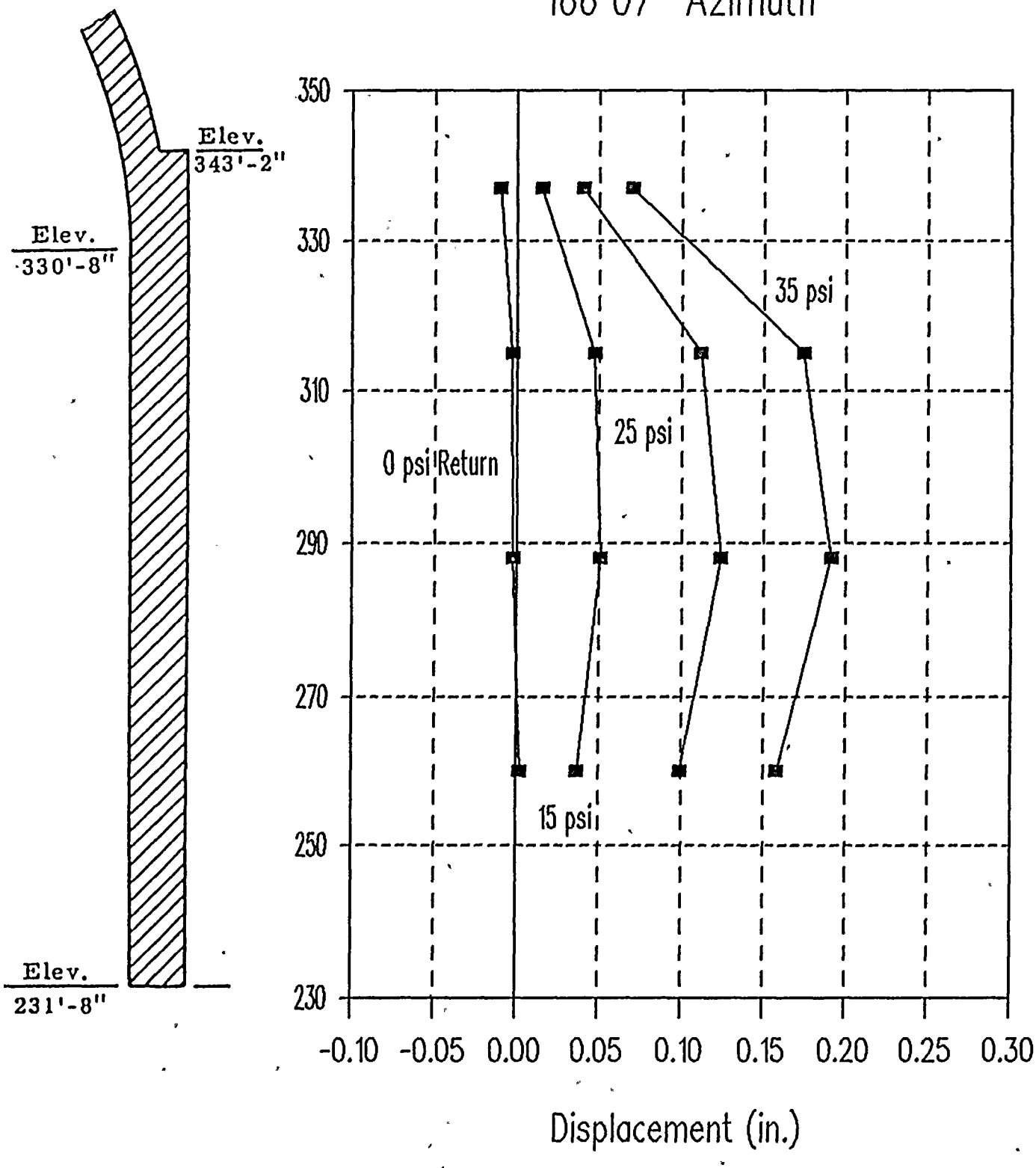

Figure 2. Radial Disp. Vs. Elevation

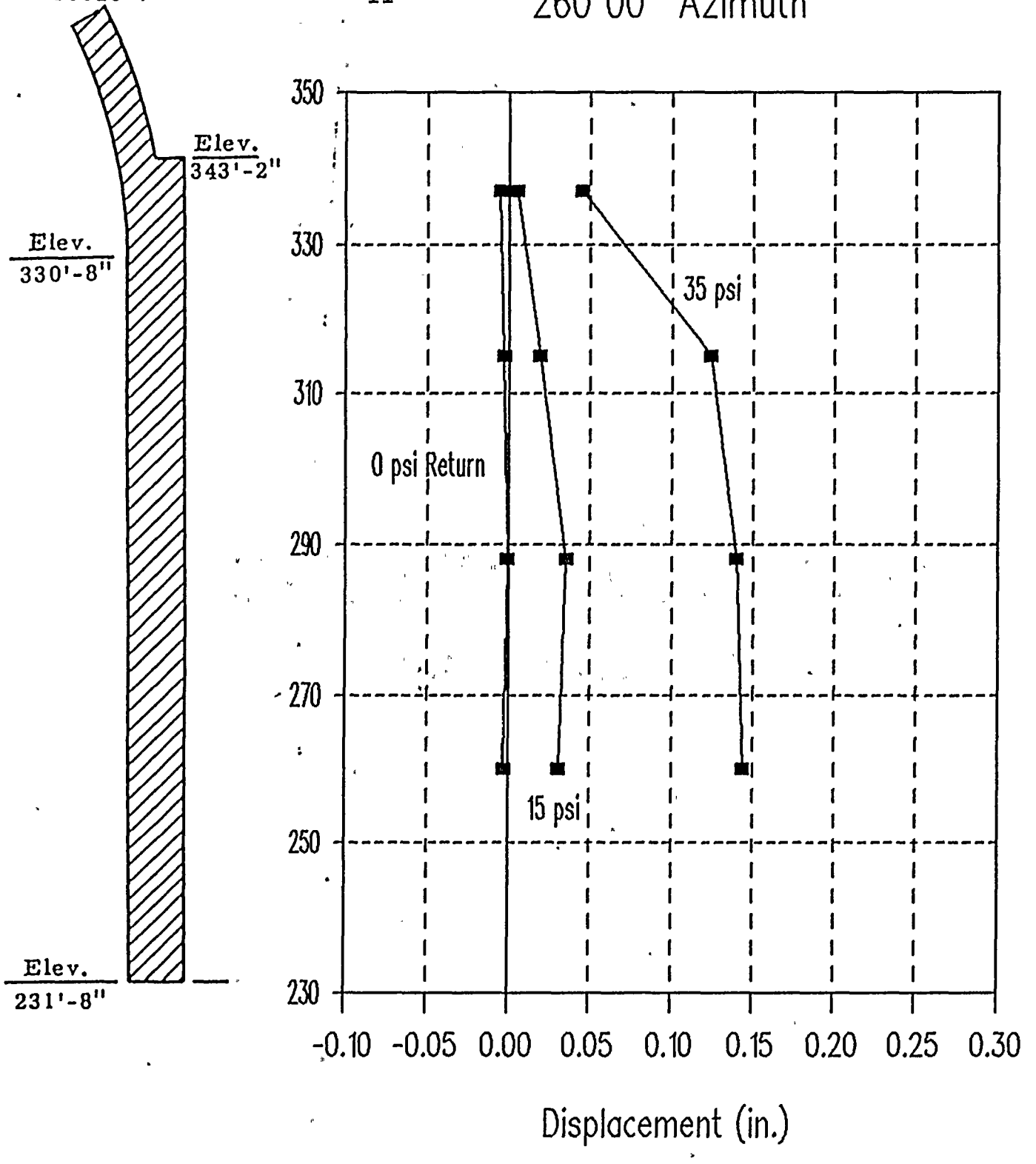

Figure 3. Radial Disp. Vs. Elevation

5.0 DISCUSSION OF RESULTS

5.1 Radial Growth Results:

The accuracy of the radial growth data is estimated to be within 0.005 to 0.010 inches. These figures are based on the precision of the equipment used and the sight distances for the individual scale locations. This accuracy is consistent with the original test results conducted in 1969.

5.2 Rebar Stress Results:

The accuracy of the rebar stress data is estimated to be within ± 500 to 1000 psi. This is a conservative estimate based primarily on the age of the strain gage installations which were installed in 1968. It is also based on the electrical insulation resistance readings to ground recorded prior to the ILRT. The actual accuracy of the stress data may be better than estimated.

APPENDIX A

SPECIFICATION, PROCEDURES AND MATERIAL PROVIDED BY ROCHESTER GAS AND ELECTRIC CO.

Documents:

- Containment Building Radial Displacement Measurement Services. R.E. Ginna Nuclear Power Plant Specification CE-165.
- Integrated Leak Rate Test Containment Structural Inspection Procedure No. RSSP-6.5
- Containment Integrated Leakage Rate Test - Procedure No. RSSP-6.0.
- Consumable Material Control System. Restricted Use Permit No. 93:104 - Product: Loctite Fast Cure Epoxy 45.

ROCHESTER GAS AND ELECTRIC CORPORATION

Containment Building

Radial Displacement Measurement Services

R. E. Ginna Nuclear Power Plant

CE-165

Issued By Rochester Gas & Electric Corp.
Nuclear Engineering Services

Issue	Rev. No.	Date	Status
#1	0	9/25/92	Issue for Bidding

JJF\268

Containment Building Radial Displacement Measurement Services

R. E. Ginna Nuclear Power Plant

Rochester Gas & Electric Corp.

Approval Page

Prepared By: _____
Responsible Engineer

Reviewed By: _____
Quality Assurance

Approved By: _____
Manager Structural & Construction Engineer

REVISION STATUS SHEET

Page	Latest Rev.	Page	Latest Rev.	Page	Latest Rev.
i	0				
ii	0				
iii	0				
1	0				
2	0				
3	0				
4	0				
5	0				
6	0				
Attachment #	1	"Proposal Form I"			
Attachment #	2	Drawing Index			

CONTAINMENT BUILDING RADIAL DISPLACEMENT MEASUREMENT SERVICES FOR R.E. GINNA NUCLEAR POWER PLANT

Table of Contents

CONTAINMENT BUILDING RADIAL DISPLACEMENT MEASUREMENT SERVICES

R. E. GINNA NUCLEAR POWER PLANT

INSTRUCTIONS TO BIDDER'S

1.0 PROPOSAL

The Bid Proposal shall not be considered unless it includes Proposal Form I, consisting of the accompanying form properly and completely filled out. The Bidder shall use the same format and page numbering when submitting the Bid Proposal.

2.0 PRICE INFORMATION

The base price shall appear only where specified in the Proposal Form I, and shall not appear elsewhere in the Bid Proposal. Other price information, such as options and alternates, shall be given as a price addition to or deduction from the base price as specified in the Proposal Form I, or attached thereto. Unit Prices (if any) shall be as specified in Proposal Form I. Price information shall not be included in the Bid Proposal transmittal letter or in the Bidder's technical or other nonprice data information.

3.0 COMPLETENESS OF PROPOSAL

3.1 Bidder is hereby notified that it is Rochester Gas and Electric's intention that the Bid Proposal shall be complete in order to avoid extras to the Contract price.

3.2 Bidder shall include in the Bid Proposal, pricing for all work which is indicated or implied in the Bid Documents, whether or not such work is fully detailed.

3.3 Bidder's proposal will not be considered unless all items in the proposal forms are completely filled out. Bidder shall use a "Not Applicable-(N/A)" if the item does not apply.

4.0 LOCATION

4.1 The R. E. Ginna Nuclear Power Plant is located 15 miles northeast of Rochester, New York, on the south shoreline of Lake Ontario.

4.2 All Bid Proposals shall be returned to RG&E by the due date of Friday, October 30,1992 to the following mailing address (Corporate Offices):

Mr. Gregory J. Fuller
Department Manager and Purchasing Agent
Materials Management Department
Rochester Gas & Electric Corporation
49 East Avenue
Rochester, NY 14649
Attention: Robert J. DiBaudo

5.0 GENERAL

5.1 The R. E. Ginna Nuclear Power Plant is a single unit site owned and operated by the Rochester Gas and Electric Corp. The unit incorporates a Westinghouse design 2-loop Nuclear Steam Supply System and Turbine-Generator rated at 490 megawatts electrical.

5.2 The R. E. Ginna Nuclear Power Plant expects to conduct it's annual refueling outage of the Ginna plant from March 19, 1993 thru to May 8, 1993. The work described in this document must be performed during the last two (2) weeks of April 1993, prior to the restart of the plant.

6.0 SCOPE OF WORK

6.1 Containment Building Radial Displacement Measurements.

The Contractor shall supply all equipment, materials, personnel, and procedures required to collect, check, and record the radial growth and rebound of the Containment Building during RG&E's performance of the structure's Integrated Leak Rate Test (I.L.R.T.).

Three (3) sets of four (4) displacement measuring scales are located at three (3) azimuth locations around the Containment Building, as listed below:

Elevation	Azimuth
260'-0"	40°42', 166°07', 260°00'
288'-0"	40°42', 166°07', 260°00'
315'-0"	40°42', 166°07', 260°00'
337'-0"	40°42', 166°07', 260°00'

Optical alignment scales whose markings are calibrated to be read to within ± 0.001 inches will be mounted at each location.

A full set of displacement measurements will be recorded at each of five (5) pressure levels (i.e., 0, 15, 35, 15, and 0 psig.). The building pressure shall be held constant for approximately one (1) hour at each pressure while the structural data is being recorded. Time durations at each pressure level may be extended for I.L.R.T. requirements. Pressurization and depressurization rates will not exceed five (5) psig per hour. The acquisition of structural data shall not interfere with either the performance of the I.L.R.T. or the acquisition of I.L.R.T. data.

The actual method used to obtain radial displacement data shall be subject to the approval of the Responsible Engineer prior to the award of the contract. The proposed method of measurement shall be briefly listed on the Proposal Bid Sheet (item 1) to be evaluated in detail with price structure of each proposal after submittal.

The past method of data collection used was through the use of jig transits and optical micrometers to read the displacement scales mounted to the exterior wall of the Containment Building. Three (3) equipment set-up stations shall be utilized, one (1) at each azimuth. A full set-up of equipment is required at each azimuth; however, only two (2) stations need be manned continuously during the I.L.R.T. At azimuths 40°42' and 260°00' the measuring equipment will be set up at the floor elevation of approximately 253'6", with the backsite placed on the ring beam foundation located at elevation 231'8". At azimuth 166° 07' the measuring equipment will be set up at floor elevation 271'0" with the backsite placed at elevation 253'6". The accuracy of each reading will be required to be within $\pm$ 0.005 inches.

6.2 Deliverables

At the completion of the radial displacement measurement work, supply the following items:

A. Certification and calibration paperwork for personnel and equipment used to perform the measurements.

B. A hard copy of the raw measurement data showing angle and distance information.

C. A tabulated presentation of the measurements taken at each location showing displacement versus Containment Building pressure.

D. A graphical presentation of the measurements taken at each location showing displacement versus Containment Building pressure.

E. The originals made of any calculations performed or drawings made.

F. The original documentation of any computer printout or hand printed documentation compiled for this work.

7.0 WORK BY OTHERS

7.1 Owner will remove penetration fire barriers necessary to establish straight line-of-sight viewing as detailed on RG&E Drawing #33013-2598. The following areas are expected to require fire barrier removal.

A. Auxiliary Building Operating Floor Level 271'0", penetration number A-57-P.

B. Auxiliary Building Intermediate Floor Level 253'0", penetration number A-139-P.

C. Intermediate Building (West) Basement Floor Level 253'6", penetration number I-16-P.

D. Intermediate Building (West) Exhaust Fan Floor Level 293'0", penetration number I-57-P.

E. Intermediate Building (North) Basement Floor Level 253'8", penetration number I-90H-P.

7.2 Owner will relocate or remove any obstruction that interferes with line of sight viewing.

7.3 Owner will provide lighting and other electrical requirements.

7.4 Owner will determine and provide necessary decontamination of work areas.

7.5 Owner will provide Radiation Protection personnel, equipment and dosimetry for the work.

8.0 WORK SCHEDULE

8.1 Outage schedules are subject to change based on operating conditions. Contractors will be notified of any such schedule changes.

A. Tentative 1993 Refueling Outage period will run from March 19, 1993 to May 8, 1993.

B. Work scope herein will be performed during the I.L.R.T scheduled to run from April 23 to April 28, 1993 on an around the clock schedule.

C. Contractor will be notified of the work start date 60 days prior to start of outage.

8.2 The Work shall be scheduled on the basis of two shifts per day of twelve (12) hours per shift, seven (7) days per week, until such times as the work is complete. Contractor shall adequately man and equip the job and work such hours and days as may be necessary to meet the work schedule.

8.3 The Owner will work with the successful Bidder to schedule the work in coordination with the performance of the I.L.R.T.

8.4 Personnel proposed by the Contractor shall be involved in manning the Work throughout the duration of the Contract. When necessary due to absence by regularly assigned personnel, other personnel shall be brought in to perform the necessary activities, to assure work schedules or due dates are not jeopardized. Such substitutions of personnel shall not be a basis for a change to costs. Supervisory personnel changes shall be approved by the Owner in writing prior to being made.

9.0 UNIQUE JOB CONDITIONS

9.1 Final report shall be submitted to Owner within forty-five (45) days of measurement completion. All data measurements become the sole property of Owner.

9.2 Site Access and Training Cost Reimbursement:

Certain costs associated with Site Access and Training activities required by the Owner will be reimbursed to the Contractor (and subcontractors) in accordance with the terms of the contract documents included with this request for services.

10.0 LICENSES, CODES AND PERMITS

The Bidder shall comply with all Federal, State of New York, and Local Codes, Ordinances, Laws and Regulations relating to execution of the Work.

11.0 INTERPRETATION OF TECHNICAL DOCUMENTS

If a Bidder is in doubt as to the true meaning or intent of any part of the technical documents, the Bidder will submit a written request for interpretation. The interpretation will be made by Addenda only, and issued to all Bidders on record. Bidders will strictly adhere to the Owner's written interpretation of all documents. The Owner will not be responsible for any other explanations or interpretations.

12.0 BIDDER's MEETING AND EXAMINATION OF SITE

There is no formal bidder's meeting scheduled. However, it is recommended that each Bidder visit the site to gain a good understanding of working conditions and constraints on the Ginna site that will impact the performance of the required scope of work. Those visits should be arranged with Mr. John J. Ferraro, Responsible Engineer, RG&E Nuclear Engineering Services at (716) 724-8115.

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ATTACHMENT #1
TO CE-165

PROPOSAL FORM I
PROPOSAL BID SHEET

Containment Building Radial Displacement
Measurement Services for the
R. E. Ginna Nuclear Power Plant
EWR #5181

DUE DATE: **Friday, October 30, 1992**

Materials Management Department
Rochester Gas and Electric Corporation
49 East Avenue
Rochester, New York 14649

1. Proposed measurement method: _____

2. The cost of providing all services required for the manpower, equipment, data accumulation and final report as described in Specification CE-165.

   Total Lump Sum Bid $_____

3. The total lump sum bid shall be broken down as follows:

   a. Personnel

      1. Straight Time Rate $_____ /HR X _____ HRS = $_____
      2. Overtime Rate $_____ /HR X _____ HRS = $_____
      3. Premium Time Rate $_____ /HR X _____ HRS = $_____

   b. Equipment $_____

4. Exceptions and specific deviations taken from the Specification CE-165, as listed:

   _____

   _____

   _____

5. For scope additions or conditions beyond Contractor's control provide the all inclusive daily rates for the total organization, services, and equipment as follows:

   Mobilization Charge $_____
   Demobilization Charge $_____

6. The submittal of a bid for this project hereby certifies the bidder and each person on the bidder's behalf, to the conditions of the contract documents.

Witnessed By:

_____

Bidder:

_____

By:_____

ITS:_____

Date:_____

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ATTACHMENT #2
TO CE-165

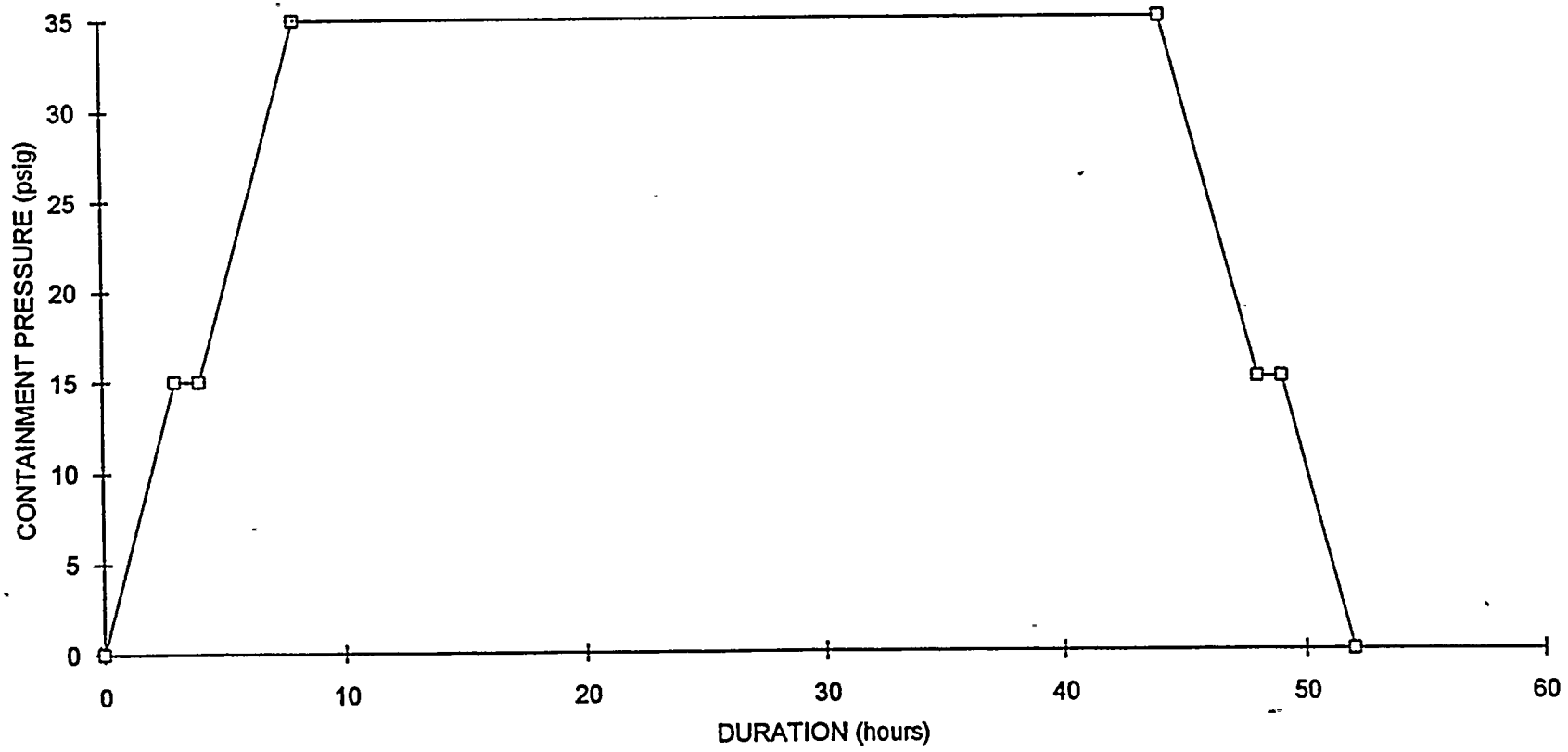
CONTAINMENT BUILDING RADIAL DISPLACEMENT MEASUREMENT SERVICES
DRAWING INDEX SHEET

RG&E	33013-2132	Plant Arrangement - Reactor Containment Building Cross-Section
	33013-2598	I.L.R.T. Structural Instruments - Replacement of Displacement, Plan and Section 3.
	5181-SK-1	1993 I.L.R.T. Ideal Schedule

JJF\271

RG+E DRAWING #5181-SK-1

IDEAL ILRT SCHEDULE
1993 ILRT



ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 4

PROCEDURE NO. RSSP-6.5 REV. NO. 4

INTEGRATED LEAK RATE TEST

CONTAINMENT STRUCTURAL INSPECTION

TECHNICAL REVIEW

PORC REVIEW DATE 3-24-93

Thomas A. Marlow
PLANT SUPERINTENDENT

3-26-93
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

THIS PROCEDURE CONTAINS 8 PAGES

GINNA STATION
START:
DATE _____
TIME _____
COMPLETED:
DATE _____
TIME: _____

RSSP-6.5

INTEGRATED LEAK RATE TEST

CONTAINMENT STRUCTURAL INSPECTION

1.0 **PURPOSE:**

1.1 This procedure provides the necessary instructions to perform a general visual structural inspection of the accessible interior and exterior surfaces of the containment structure and its components prior to, during and after the performance of tests intended to measure the primary reactor containment system overall Integrated Leakage Rate (Type A-I.L.R.T.). This inspection is designed to uncover any evidence of structural deterioration which may affect either the containment structural integrity or leak tightness.

2.0 **TEST REQUIREMENTS:**

2.1 Scope

2.1.1 A visual inspection of all accessible interior and exterior surfaces of the containment structure prior to the performance of any Type A containment structure Integrated Leak Rate Test (I.L.R.T.).

2.1.2 A visual inspection of all accessible exterior surfaces of the containment structure after attaining the maximum test pressure of any Type A-I.L.R.T.

2.1.3 A visual inspection of all accessible interior and exterior surfaces of the containment structure more than twenty-four (24) hours after full depressurization from any Type A-I.L.R.T. to allow for total stress relaxation of the structure.

2.1.4 The visual examination of any accessible concrete surface on the containment structure, including coated areas, shall include visual examination for distress, deterioration, or excessive cracking which may be indicative of damage or degradation, such as the examples defined in ACI 201.1R-68, "Guide For Making A Condition Survey of Concrete In Service".

2.1.5 The visual examinations required by this procedure are the responsibility of the Structural Engineering Group and shall be performed by or under the direction of a registered Professional Engineer experienced in evaluating the in-service condition of structural concrete.

2.2 Exempt Items

2.2.1 The following items are exempt from this visual examination: portions of the concrete surface that are covered by the containment liner, foundation material, backfill or other adjacent structures, components and parts.

2.3 Acceptance Criteria

2.3.1 Prior to commencement of any Type A-I.L.R.T., any evidence of deterioration or degradation found during the pre-test visual inspection shall be reviewed and evaluated by Engineering. Pressurization for the I.L.R.T. shall not commence until a full evaluation has been performed by Engineering and any corrective action required is taken.

2.3.2 Prior to the commencement of any Type A-I.L.R.T., any pattern of cracking that exceeds one-one hundredth (0.01) of an inch in width and six (6) inches in length shall be mapped. Inspection and mapping of each such area shall be performed before pressurization, at each pressure increment specified in RSSP-6.0, and after the test. Each area mapped should include at least forty (40) square feet.

2.3.3 At the conclusion of any Type A-I.L.R.T., no visible signs of permanent damage to either the containment structure or the steel liner shall be evident. Evidence of spalling, laminations or voids behind the liner are pertinent considerations. Special care shall be exercised to detect any evidence of localized distress: if areas of localized distress are detected, a full evaluation shall be performed by Engineering to determine if any corrective action is required before this procedure is signed off.

3.0 REFERENCES:

3.1 Procedure No. RSSP-6.0, Containment Integrated Leakage Rate Test.

3.2 10CFR50, Appendix J, "Leakage Tests For Containments of Light-Water-Cooled Nuclear Power Plants".

3.3 ASME Section III, Div. 2, Article CC-6000 and Article IWL-2420.

3.4 SEP Topic III-7.A, In-Service Inspection Including Pre-Stressed Concrete Containments with Either Grouted or Ungrouted Tendons.

3.5 ACI 201.1R-68, Guide for Making a Condition Survey of Concrete In Service.

3.6 ANSI/ANS-56.8-1987, Containment System Leakage Testing Requirements.

4.0 INITIAL CONDITIONS:

4.1 Plant is in cold shutdown status. _____

4.2 M-102 Inspection & Maintenance of Containment Liner Insulation has been performed by the Ginna Plant Maintenance Group and is completely signed off. _____

4.3 An SWP has been obtained for inspections which require entry to locked high radiation areas. _____

4.4 Notify Health Physics prior to performing inspection of Tendon Anchor Heads to establish radiation protection requirements. _____

4.5 Inspection substeps need not be done in sequence, except where specifically stated. _____

4.6 Notify ILRT Test Coordinator at start of inspection. _____

5.0 PRECAUTIONS:

5.1 Observe company safety rules and Ginna Station Health Physics rules while performing inspections.

6.0 **INSTRUCTIONS:**

6.1 **EXTERIOR:**

6.1.1 Perform a visual inspection of the exterior surface of the Containment structure prior to pressurization for any Type A-I.L.R.T. at the following locations. The sequence of inspection can be performed in any order:

6.1.1.1 Access the walkway around the Containment Building tendon anchor heads from the west stairwell of the Turbine Building and the roof of the adjacent Intermediate Building. Inspect the concrete around all of the tendon anchor head assemblies for signs of deterioration or cracking described by Section 2.1.4. _____

6.1.1.2 Access the areas around the equipment hatch from grade elevation on the east side, adjacent to the main transformers. Inspect the concrete around the equipment hatch for signs of deterioration described in Section 2.1.4. _____

6.1.1.3 Access all floor levels of the north section of the Intermediate Building, including the walkway adjacent to the "B" loop main steam line. Inspect the concrete at each level for signs of deterioration described by Section 2.1.4 at the following elevations:

6.1.1.4 Intermediate Building South (Controlled Area) locations:

a. Sub-basement @ 237'-0" & 238'-6" _____
b. Basement @ 253'-6" _____
c. Platform @ 267'-3" _____
d. Floor @ 271'-0" (HP desk area) _____
e. Floor @ 293'-0" _____
f. rooftop @ 318'-0" (IB low roof) _____

6.1.1.5 Intermediate Building North (non-controlled area) locations:

a. Basement @ 253'-6" _____
b. Platform @ 267'-3" _____
c. Floor @ 267'-3" _____
d. Floor @ 298'-4" _____
e. Floor @ 315'-4" _____
f. Rooftop @ 336'-6" (IB High Roof). _____

6.1.1.6 Access all floor levels of the Auxiliary Building. Inspect the concrete for signs of deterioration at each of the following elevations:

a. Basement floor @ 235'-8" _____
b. Intermediate floor @ 253'-0" _____
c. Operating floor @ 271'-0" _____
d. Platform floor @ 311'-6" _____

6.2 INTERIOR:

6.2.1 Perform a visual inspection of the interior surface of the Containment structure prior to pressurization for any Type A-I.L.R.T. at the following locations. The sequence of inspection can be performed in any order:

6.2.1.1 Access all floor and platform levels of interior of the Containment Building. Inspect the liner for localized distress or indications of concrete deterioration behind the liner, as described in Section 2.3.3, at the following elevations:

a. Basement floor level @ 235'-8" _____
b. Intermediate floor level 253'-3" _____
c. Operating floor level 278'-4" & 274'6" _____
d. Air filter platform level 300'-4" _____
e. Containment Building crane platform level 320'-6" _____

6.2.2 Notify the ILRT Test Coordinator, immediately following completion of sections 6.1 and 6.2, that Containment pressurization may be started as directed by RSSP-6.0.

_____

6.3 FULL PRESSURE (35 or 60 psig):

6.3.1 Perform a visual inspection, in any sequence, of the exterior surface of the containment structure after stabilization at full pressure for any Type A-I.L.R.T. and verify that the inspection has been completed on the lines shown below:

6.3.1.1 Access the walkway around the Containment Building tendon anchor heads from the west stairwell of the Turbine Building and the roof of the adjacent Intermediate Building. Inspect the concrete around all of the tendon anchor head assemblies for signs of deterioration or cracking described by Section 2.1.4.

_____

6.3.1.2 Access the areas around the equipment hatch from grade elevation on the east side, adjacent to the main transformers. Inspect the concrete around the equipment hatch for signs of deterioration described in Section 2.1.4. _____

6.3.1.3 Access all floor levels of the North section of the Intermediate Building, including the walkway adjacent to the "B" loop Main Steam line. Inspect the concrete at each level for signs of deterioration described by Section 2.1.4 at the following elevations:

6.3.1.4 Intermediate Building (Controlled Side) locations:

a. Sub-basement @ 237'-0" & 238'-6" _____
b. Basement @ 253'-6" _____
c. Platform @ 267'-3" _____
d. Floor @ 271'-0" (HP desk area) _____
e. Floor @ 293'-0" _____
f. Rooftop @ 318'-0" (IB low roof) _____

6.3.1.5 Intermediate Building (clean side) locations:

a. Basement @ 253'-6" _____
b. Platform @ 267'-3" _____
c. Floor @ 267'-3" _____
d. Floor @ 298'-4" _____
e. Floor @ 315'-4" _____
f. Rooftop @ 336'-6" (IB high roof) _____

6.3.1.6 Access all floor levels of the Auxiliary Building. Inspect the concrete for signs of deterioration at each of the following elevations:

a. Basement floor @ 235'-8" _____
b. Intermediate floor @ 253'-0" _____
c. Operating floor @ 271'-0" _____
d. Platform floor @ 311'-6" _____

6.3.2 Notify the ILRT Test Coordinator, immediately following completion of section 6.3, that Containment depressurization may be started as directed by RSSP-6.0. _____

6.4 <u>[illegible]TER DEPRESSURIZATION</u>:

6.4.1 Perform a visual inspection, in any sequence, of both the exterior and interior surfaces of the Containment structure at least twenty-four (24) hours after depressurization from any Type A-I.L.R.T. and verify that the inspection has been completed on the lines shown below:

6.4.1.1 Access the walkway around the Containment Building tendon anchor heads from the west stairwell of the Turbine Building and the roof of the adjacent Intermediate Building. Inspect the concrete around all of the tendon anchor head assemblies for signs of deterioration or cracking described by Section 2.1.4.

_____

6.4.1.2 Access the areas around the equipment hatch from grade elevation on the east side, adjacent to the main transformers. Inspect the concrete around the equipment hatch for signs of deterioration described in Section 2.1.4. _____

6.4.1.3 Access all floor levels of the north section of the Intermediate Building, including the walkway adjacent to the "B" loop main steam line. Inspect the concrete at each level for signs of deterioration described by Section 2.1.4 at the following elevations:

6.4.1.4 Intermediate Building South (controlled area) locations:

a. Sub-basement @ 237'-0" & 238'-6" _____
b. Basement @ 253'-6" _____
c. Platform @ 267'-3" _____
d. Floor @ 271'-0" (HP desk area) _____
e. Floor @ 293'-0" _____
f. Rooftop @ 318'-0" (IB low roof) _____

6.4.1.5 Intermediate Building North (non-controlled area) locations:

a. Basement @ 253'-6" _____
b. Platform @ 267'-3" _____
c. Floor @ 267'-3" _____
d. Floor @ 298'-4" _____
e. Floor @ 315'-4" _____
f. Rooftop @ 336'-6" (IB high roof) _____

6.4.1.6 Access all floor levels of the Auxiliary Building. Inspect the concrete for signs of deterioration at each of the following elevations:

a. Basement floor @ 235'-8" _____
b. Intermediate floor @ 253'-0" _____
c. Operating floor @ 271'-0" _____
d. Platform floor @ 311'-6" _____

6.4.1.7 Perform a visual inspection of the interior surface of the Containment structure after depressurization from any Type A-I.L.R.T. in the following manner:

6.4.1.8 Access all floor and platform levels of interior of the Containment Building. Inspect the liner for localized distress or indications of concrete deterioration behind the liner, as described in Section 2.3.3, at the following elevations:

a. Basement floor level @ 235'-8" _____
b. Intermediate floor level 253'-3" _____
c. Operating floor level 278'-4" & 274'-6" _____
d. Air filter platform level 300'-4" _____
e. Containment Building crane platform level 320'-6" _____

6.5 Upon the completion of this procedure for any Type A-I.L.R.T., this procedure and the data obtained through its implementation shall be reviewed and signed off by a representative of the Structural Engineering Group on the line below:

COMPLETED BY: _____

DATE COMPLETED: _____

STRUCTURAL ENGINEERING: _____

HEAD CONTROL OPERATOR: _____

SHIFT SUPERVISOR: _____

RESULTS & TEST REVIEW: _____ DATE: _____

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 4

PROCEDURE NO. RSSP-6.0 REV. NO. 19

CONTAINMENT INTEGRATED LEAKAGE RATE TEST

TECHNICAL REVIEW

PORC REVIEW DATE 3-24-93

Thomas A. Marlow
PLANT SUPERINTENDENT

4-2-93
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

THIS PROCEDURE CONTAINS 40 PAGES

GINNA STATION
START:
DATE _____
TIME _____
COMPLETED:
DATE _____
TIME: _____

RSSP-6.0

CONTAINMENT INTEGRATED LEAKAGE RATE TEST

1.0 PURPOSE:

1.1 To provide steps for conducting the Type "A" Containment Integrated Leakage Rate Test (ILRT) and Verification Test.

2.0 TEST REQUIREMENTS:

2.1 To verify that leakage from Containment does not exceed the allowable leakage rate for reduced pressure testing governed by the following relationship:

$$Lt = La\ (Pt/Pa)^{\frac{1}{2}}$$

$$Lt = (.2)\ (35/60)^{\frac{1}{2}} = .1528 \text{ wt. \%/day}$$

THEREFORE

$$.75\ Lt = (.75)\ (.1528) = .1146 \text{ wt. \%/day}$$

Where:
- Lt = maximum allowable leakage rate at Pt (wt. %/day)
- La = maximum allowable leakage rate at Pa (0.2 wt. %/day)
- Pt = Reduced test pressure (35 psig)
- Pa = Accident Pressure (60 psig)
- V = Containment Free Volume (1.0×10^6 ft.^{3})

2.2 The allowable operational leakage rate (Lt) which must be met prior to resumption of power operation following a test is not to exceed 0.75 Lt. The measured leakage rate (Ltm) is not to exceed .75 Lt at the upper 95% confidence level using Mass Point or Total Time Analyses methods.

2.3 Instrumentation used to determine leak rate should remain operable during the entire test. As a minimum, one Containment pressure instrument, sixteen Containment temperature RTDs, and three dewpoint sensors shall be operable; otherwise, the test may be invalid. If a spurious reading is obtained and it appears not to be attributable to a sensor malfunction, the data rejection criteria of ANS 56.8-1987, Appendix D may be applied for the purpose of rejecting that datapoint.

3.0 REFERENCES:

3.1 R.E. Ginna Nuclear Power Station, "Type "A" Reactor Containment Building Periodic Retest Results".

3.2 Technical Specifications, Section 4.4:1.

3.3 10 CFR 50, Appendix J.

3.4 ANSI N45.4-1972.

3.5 ANSI/ANS 56.8-1987.

3.6 BN-TOP-1, Rev. 1 - 1972.

3.7 Reg. Guide 1.18, Rev. 1, 12/28/72, "Structural Acceptance Test for Concrete Primary Reactor Containments".

3.8 RSSP-6.5, ILRT Containment Structural Inspection.

3.9 NSL-0000-DA042, Design Analysis Ginna Station Containment Isolation Valve Listing.

4.0 INITIAL CONDITIONS:

4.1 SIPE Implementation Control Form has been completed per A-52.15. _____

4.2 Preparational steps within this procedure need not be performed in sequence, but as directed by the test coordinator. _____

4.3 An events log will be maintained throughout the testing interval, from start of initial pressurization of the Reactor Containment Building to the conclusion of final depressurization of the building. _____

4.4 Plant is in Cold Shutdown condition. _____

4.5 Residual Heat Removal System is in service as required, to maintain proper Reactor Coolant System Temperature. _____

NOTE: PZR level will decrease during pressurization and make-up may be required. PZR level will increase during depressurization.

4.6 Notify Operations to initiate Attachment E, RCS Level Control, steps 1.1 to 2.7, to ensure the Pressurizer has an indicated level of $\leq$ 50% and will be vented to the Containment atmosphere. _____

4.7 The required ILRT panel instrumentation has been calibrated within 6 months prior to performing test. Records of calibration will be maintained and will be traceable to NBS (See Attachment A-Instrument Calibration Data). _____

4.8 To assess any possible external effects upon test results, the following data will be recorded and/or logged at intervals of less than or equal to 1 hour:

4.8.1 Barometric pressure. _____

4.8.2 Temperature. _____

4.8.3 Weather Conditions, e.g. - cloudy, rainy, clear, windy, etc. _____

4.9 Lead test personnel are qualified in accordance with A-1102 and have had a Pre-test briefing on test requirements. _____

4.10 Notify Shift Supervisor at start of test. _____

4.11 Notify Head Control Operator at start of test. _____

4.12 Notify Q.C. Dept at start of test. _____

4.13 Health Physics Work Permits have been issued to facilitate inspection of all affected areas for duration of the test. _____

4.13.1 Notify HP that a Constant Air Monitor (CAM) will be needed at the ILRT panel inside door 37, <u>prior</u> to the start of Containment pressurization. _____

4.14 Ensure the following procedures have been completed to the point where pressurization may commence:

4.14.1 RSSP-6.1 ILRT Valving Alignment. _____

4.14.2 RSSP-6.2 Pressurization Monitoring of Penetrations During Containment ILRT. _____

4.14.3 RSSP-6.3 Air Supply for ILRT. _____

4.14.4 RSSP-6.4 ILRT Instrument Integrity Check. _____

4.14.5 RSSP-6.5 ILRT Containment Structural Inspection. (Sections 6.1 and 6.2 complete) _____

4.14.6 RSSP-6.6 Hydro Test of CV Air Test After Cooler (Optional, may be marked N/A if not performed). _____

4.14.7 RSSP-6.7 ILRT Instrumentation Preparation. _____

4.14.8 RSSP-6.8 ILRT RTD Temperature Survey. (Optional, may be marked N/A if not performed). _____

4.14.9 RSSP-6.9 ILRT Dewcell Survey. (Optional, may be marked N/A if not performed). _____

4.14.10 Installation of "A" and "B" S/G Handhole covers, GMS-43-11. _____

4.14.11 Installation of "A" and "B" S/G Secondary Manway Covers, GMS-43-12. _____

4.14.12 Installation of 3" Diameter Inspection Port Cover - Number 4 Wedge Area, GMS-43-20. _____

4.14.13 Installation of 3" Diameter Inspection Port Cover - Number 6 Wedge Area, GMS-43-21. _____

4.14.14 Installation/Removal of Purge Supply and Exhaust Flanges, M-101. _____

4.14.15 Containment Isolation Valve Leak Rate Testing - Purge Supply and Purge Exhaust PTT-23.35.1 and PTT-23.36.1. _____

4.14.16 PT-22.1 & 22.2 to ensure Personnel & Equipment Hatch Seal Integrity. _____

4.15 Obtain the following pre-test levels and record on Attachment D:

4.15.1 CONTAINMENT SUMP A LEVEL - MCB indicators

LI 2039 _____

LI 2044 _____

4.15.2 CONTAINMENT SUMP B LEVEL - Dip stick method _____

4.15.3 PRESSURIZER COLD CALIBRATION LEVEL - MCB indicator LI 433 _____

4.15.4 REACTOR COOLANT DRAIN TANK LEVEL - WDP LI-1003 _____

4.15.5 PRESSURIZER RELIEF TANK LEVEL - MCB indicator. LI-442 _____

4.16 Ginna Station Test Tag Control Program, A-1103, shall be utilized as required for test tags prepared under Attachment "C". _____

4.17 Notify Fire Protection that fire system Z-16 must be disconnected for entire duration of ILRT. _____

4.18 Notify Structural Engineering Dept. that initial pre-pressurization radial displacement measurements may be taken. _____

5.0 PRECAUTIONS:

5.1 To avoid the possibility of having to abort the test, resulting from valving alignment other than that required for test period, all daily anticipated maintenance work on Primary System valving and piping must be discussed and cleared with Results and Test Supervision. In addition, test personnel should be instructed not to perform valving alignments or tighten fittings or packing without clearance from Results and Test Supervision. This is especially important during any leak detection operations. Failure to observe this may result in failed test even though leakage rate is acceptable.

5.2 During the period between the initiation of the Containment inspection and performance of the Type A Test, no repairs or adjustments shall be made so that the Containment can be tested in as close to "as is" condition as practical. However, if during the Type A test repairs and/or adjustments are necessary, a new Type A test shall be initiated and any such associated corrective actions taken, will be included in the final report submitted to the NRC.

5.3 Necessary steps will be taken by all departments to afford protection for equipment inside Containment, which could be subject to damage as a result of test pressure. (e.g. - fire detection systems, unvented tanks, pressure sensitive devices.)

5.4 In the unlikely event an inspection team is required to enter Containment (at approximately 14 psig level), the Containment air activity will be monitored by the Health Physics Department and the following precautions observed: (Refer to procedure A-1.6.4 "Requirements For Safe Work In Confined Spaces").

5.4.1 At least 6 minutes will be utilized for pressure equalization as personnel are passing through the personnel hatch. Personnel are not to be subjected to the 14 psig level for a time period in excess of two hours.

5.4.2 When exiting Containment, hatch depressurization should not exceed the rates specified below. Use a portable pressure indicator for monitoring.

5.4.2.1 Stage 1. Pressure reduction from 14 psig, at an essentially uniform rate $\leq$ 5 psig/minute, to 4 psig.

5.4.2.2 Stage 2. Pressure reduction from 4 psig, at an essentially uniform rate $\leq$ 1 psig/minute to 0 psig.

5.5 Test control tags will be placed on concerned valves and equipment to ensure that alignment conditions are maintained throughout the testing interval.

5.6 The isolation valve/valves of any system (excluding RHR system) remaining in service during the testing interval shall be subjected to a local Class C leakage check upon completion of the ILRT. Any existing local leakage shall be added to the results of ILRT.

5.7 To assure no infiltration of air into the Containment building during the test, the air supply header shall be vented to atmosphere after attaining desired pressure.

5.8 Wear ear protection when working at compressors or depressurizing Containment.

6.0 **INSTRUCTIONS:**

6.1 Ensure the following fans are secured:

6.1.1 Containment Auxiliary Charcoal Filter Fans.
A _____
B _____

6.1.2 Reactor Compartment Cooling Fans. A _____
B _____

6.1.3 Control Rod Shroud Fans. A _____
B _____

6.1.4 Reactor Cavity Supply and Exhaust Fans.
Supply _____
Exhaust _____

6.1.5 Mini-Purge Supply Fan. _____

6.1.6 Containment Recirculation Fans. A _____
B _____
C _____
D _____

6.2 Depressurize the Safety Injection Accumulators and the Overpressurization Accumulators to Containment atmosphere in accordance with S-16 series, if not already done.

_____

6.2.1 Remove blind flange at SI Accumulator "A" manual vent and open manual vent valve 886A. Leave open for duration of test.

_____

6.2.2 Remove blind flange at SI Accumulator "B" manual vent and open manual vent valve 886B. Leave open for duration of test.

_____

6.3 Ensure that the blind flanges are removed from the following lines <u>inside</u> containment:

6.3.1 Integrated Leakage Rate Test Supply (Penet. 317)

_____

6.3.2 Integrated Leakage Rate Test Exhaust (Penet. 313)

_____

6.4 Ensure that the flanges are removed from <u>both</u> Integrated Leakage Rate Test Exhaust Lines located on the Int. Bldg. roof adjacent to the Containment dome. _____

6.5 Verify with Operations that Attachment E, steps 1.1 to 2.7, has been completed. _____

6.6 To avoid unwanted safeguard signals as Containment pressure is being increased, pull fuses on individual power supplies in Relay Room as follows:

6.6.1 PQ 945 fuses pulled. _____

6.6.2 PQ 946 fuses pulled. _____

6.6.3 PQ 947 fuses pulled. _____

6.6.4 PQ 948 fuses pulled. _____

6.6.5 PQ 949 fuses pulled. _____

6.6.6 PQ 950 fuses pulled. _____

<u>NOTE</u>: Any associated difficulties and/or discrepancies identified in the next step must be resolved before proceeding with Containment pressurization.

6.7 Verify with Structural Engineering personnel assigned to the Containment inspection team, (both interior and exterior) that these inspections have been completed as per Initial Condition 4.14.5 inclusive. _____

6.8 At MCB, initiate Containment Isolation and Containment Ventilation Isolation by pressing either one of the "MANUAL CONTAINMENT ISOLATION" pushbutton switches. _____

6.8.1 Place Test Tags on "CONTAINMENT ISOLATION RESET" and "CONTAINMENT VENT ISOLATION RESET" switches to ensure isolation valves cannot be re-opened until required by procedure. _____

NOTE: Although AOV 427 is not a Containment Isolation valve, it will go Closed on the Containment Isolation Signal and re-open upon loss of Instrument Air.

6.9 Verify the following automatic Containment Isolation valves are "CLOSED" using normal indicators and/or status light (bright light, closed) indicators.

NOTE: Notify the ILRT Test Coordinator of any valve not found in the "CLOSED" position prior to initiating corrective action.

6.9.1	SOV 921, H_2 Mon. A Inlet	_____
6.9.2	SOV 922, H_2 Mon. A Outlet	_____
6.9.3	AOV 539, PRT To Gas Analyzer	_____
6.9.4	AOV 1789, RCDT To Gas Analyzer	_____
6.9.5	AOV 1786, RCDT To Vent Hdr.	_____
6.9.6	AOV 1787, RCDT To Vent Hdr.	_____
6.9.7	AOV 1721, RCDT Outlet	_____
6.9.8	AOV 1003A, RCDT Pmp. A Suct.	_____
6.9.9	AOV 1003B, RCDT Pmp. B Suct.	_____
6.9.10	AOV 1597, R10A/R11/R12 Suction	_____
6.9.11	AOV 1598, R10A/R11/R12 Discharge	_____
6.9.12	AOV 1599, R10A/R11/R12 Discharge	_____
6.9.13	MOV 813, CCW To Rx Supp. Clrs.	_____
6.9.14	MOV 814, CCW From Rx Supp. Clrs.	_____
6.9.15	AOV 1723, Sump A Disch.	_____
6.9.16	AOV 1728, Sump A Disch.	_____
6.9.17	SOV 923, H_2 Mon. B Inlet	_____
6.9.18	SOV 924, H_2 Mon. B Outlet	_____
6.9.19	AOV 371, Ltdn. Line Isol.	_____
6.9.20	MOV 313, RCP Seal Return	_____

6.9.21	AOV 951, Pzr. Stm. Samp. In	_____
6.9.22	AOV 953, Pzr. Liq. Samp. In	_____
6.9.23	AOV 955, B Hot Leg Samp. In	_____
6.9.24	AOV 959, RHR Sample	_____
6.9.25	AOV 966A, Pzr. Stm. Samp. Out	_____
6.9.26	AOV 966B, Pzr. Liq. Samp. Out	_____
6.9.27	AOV 966C, Hot Leg Samp. Out	_____
6.9.28	SOV 1A, H_2 Recombiner	_____
6.9.29	SOV 2A, H_2 Recombiner	_____
6.9.30	SOV 3A, H_2 Recombiner	_____
6.9.31	SOV 5A, H_2 Recombiner	_____
6.9.32	AOV 8418, Cnmt. DI Water	_____
6.9.33	AOV 7971, Mini Purge Exh.	_____
6.9.34	AOV 7970, Mini Purge Exh.	_____
6.9.35	AOV 7445, Cnmt. Lk. Test Disch.	_____
6.9.36	AOV 7478, Cnmt. Mini Purge Supply	_____
6.9.37	AOV 5879, Cnmt. Purge Exh.	_____
6.9.38	AOV 5869, Cnmt. Purge Supply	_____
6.9.39	AOV 846, Accum N_2 Supply	_____
6.9.40	MOV 7443, Cnmt. Lk. Test Sup.	_____
6.9.41	AOV 5392, Cnmt. Instr. Air	_____
6.9.42	MOV 7444, Cnmt. Lk. Test Disch.	_____
6.9.43	SOV 1B, H_2 Recombiner	_____
6.9.44	SOV 2B, H_2 Recombiner	_____
6.9.45	SOV 3B, H_2 Recombiner	_____
6.9.46	SOV 5B, H_2 Recombiner	_____

6.9.47 AOV 9227, Cnmt. Fire Hose Supply _____

6.9.48 AOV 5738, S/G B Bldn. Isol. _____

6.9.49 AOV 5737, S/G A Bldn. Isol. _____

6.9.50 AOV 508, RMW To Cnmt. Vess. _____

6.9.51 AOV 5735, S/G A Sample _____

6.9.52 AOV 5736, S/G B Sample _____

6.9.53 SV 1600A, RCDT To GA Sample Isol. Vlv. (Verify on C.I. Reset Panel) _____

NOTE: The following steps may be performed out of sequence at the discretion of the ILRT Test Coordinator.

6.10 Prior to start of pressurization of Containment perform the following:

6.10.1 Verify the following Containment Isolation valves closed at the field location by observation of mechanical indicators:

INT. BLDG - CLEAN SIDE (TDAFP AREA)

6.10.1.1 MOV 7443, Cnmt. Lk. Test Sup. (P-317) _____

6.10.1.2 AOV 5392, Cnmt. Instr. Air (P-310) _____

6.10.1.3 MOV 7444, Cnmt. Lk. Test Disch. (P-313) _____

6.10.1.4 AOV 7445, Cnmt. Lk. Test Disch. (P-309) _____

6.10.1.5 AOV 8418, Cnmt. DI Water (P-324) _____

6.10.1.6 AOV 9227, Cnmt. Fire Hose Supply (P-307) _____

6.10.1.7 AOV 5738, S/G B Bldn. Isol. (P-321) _____

6.10.1.8 AOV 5737, S/G A Bldn. Isol. (P-322) _____

6.10.1.9 AOV 1597, R10A/R11/R12 Suction (P-305) _____

6.10.1.10 AOV 1598, R10A/R11/R12 Discharge (P-305) _____

6.10.1.11 AOv 1599, R10A/R11/R12 Discharge (P-305) _____

6.10.1.12 SOV 10205S1, "A" H_2 Recombiner (P-304) _____

6.10.1.13	SOV 10209S1, "A" H_2 Recombiner (P-304)	_____
	INT. BLDG. - CONTROLLED (SAMPLE HOOD)	
6.10.1.14	AOV 5735, S/G A Sample (P-206)	_____
6.10.1.15	AOV 5736, S/G B Sample (P-207)	_____
6.10.1.16	AOV 966A, Pzr. Stm. Samp. Out (P-207)	_____
6.10.1.17	AOV 966B, Pzr. Liq. Samp. Out (P-206)	_____
6.10.1.18	AOV 966C, Hot Leg Samp. Out (P-205)	_____
6.10.1.19	SOV 10214S1, H_2 Recombiner O_2 (P-210)	_____
6.10.1.20	SOV 10214S1, H_2 Recombiner O_2 (P-210)	_____
6.10.1.21	SOV 10215S, H_2 Recombiner O_2 (P-210)	_____
6.10.1.22	SOV 10215S1, H_2 Recombiner O_2 (P-210)	_____
6.10.1.22	SOV 10211S1, "B" H_2 Recombiner (P-202)	_____
6.10.1.23	SOV 10213S1, "B" H_2 Recombiner (P-202)	_____
	AUX. BLDG.	
	MID FLOOR BY SFP HX.	
6.10.1.24	AOV 508, RMW To Cnmt. Vess. (P-121)	_____
6.10.1.25	AOV 539, PRT To Gas Analyzer (P-120)	_____
6.10.1.26	AOV 1789, RCDT To Gas Analyzer (P-123)	_____
6.10.1.27	AOV 1786, RCDT To Vent Hdr. (P-129)	_____
6.10.1.28	AOV 1787, RCDT To Vent Hdr. (P-129)	_____
6.10.1.29	AOV 7971, Mini Purge Exh. (P-132)	_____
6.10.1.30	AOV 846, Accum N_2 Supply (P-120)	_____
	AUX. BLDG.	
	MID FLOOR BY RWST	
6.10.1.31	MOV 813, CCW To Rx Supp. Clrs. (P-131)	_____

6.10.1.32 MOV 814, CCW From Rx Supp. Clrs. (P-130) _____

BASEMENT BY WEST STAIRS

6.10.1.33 AOV 1723, Sump A Disch. (P-107) _____

6.10.1.34 AOV 1728, Sump A Disch. (P-107) _____

BASEMENT BY RWST

6.10.1.35 AOV 959, RHR Sample (P-111) _____

6.10.1.36 AOV 371, Ltdn. Line Isol. (P-112) _____

6.10.1.37 MOV 313, RCP Seal Return (P-108) _____

SUB BASEMENT

6.10.1.38 AOV 1721, RCDT Outlet (P-143) _____

6.10.1.39 AOV 1003A, RCDT Pmp. 1A Suct. (P-143) _____

6.10.1.40 AOV 1003B, RCDT Pmp. 1B Suct. (P-143) _____

6.10.2 Ensure that an ILRT Events Log Book is available for use throughout the test interval. _____

6.10.3 Log initial pressure readings (penetration and manifold) for all concerned areas as listed on Data Sheets 1, 2 and 3. _____

6.10.4 Ensure that equipment is in place to monitor outside weather parameters. _____

6.10.5 Open states-blocks for MOV's 7443 and 7444 to divorce Containment Isolation signal which will allow opening of these valves as required, during pressurization/depressurization period. Location of states blocks in Relay Room Containment Isolation Relay cabinets, is as listed below:

CI-A2 Cabinet (Rear)

TB-1 states block #61 MOV 7443 Open_____
TB-1 states block #65 MOV 7444 Open_____

CI-B2 Cabinet (Rear)

TB-1 states block #61 MOV 7443 Open_____
TB-1 states block #65 MOV 7444 Open_____

NOTE: Perform these alignment steps only after ILRT Test Coordinator has initiated the Containment Isolation signals.

6.10.6 Alignment of Instrument Air line:

6.10.6.1 Ensure "CLOSED" manual valve 5397 (outside C.V.).
Closed _____

6.10.6.2 Establish vent to outside atmosphere, upstream of AOV 5392 by ensuring open test connection valves 5410, 5410A and 5410B. Remove cap at 5410B.
Vented _____

6.10.6.3 Depressurize Instrument Air header inside Containment and provide a vent to Containment atmosphere, downstream of check valve 5393 by placing control switch for AOV 834B to the Closed position.
Vented _____

6.10.7 After verifying that all personnel are out of Containment, shut off all inside lights and "LOCK CLOSED" the following access hatch outer doors.

6.10.7.1 Personnel Hatch Outer Door _____

6.10.7.2 Equipment Hatch Outer Door _____

6.10.8 Verify that Structural Engineering radial displacement measurements are complete.
_____

6.11 CONTAINMENT PRESSURIZATION AND STABILIZATION PERIOD

6.11.1 Inform the Shift Supervisor and Head Control Operator that Containment pressurization is about to begin and that an announcement regarding the start of the ILRT over the Plant P.A. System is necessary.
_____

6.11.1.1 Establish communications with Control Room to ensure personnel are available to maintain RCS Level Control as per steps 3.0 to 3.1.3 of Attachment E.
_____

6.11.2 Start the ILRT air compressors as needed and initiate air flow to Containment by performing the following:

6.11.2.1 OPEN manual valve 7440 (Supply Isolation Downstream of PCV 7439). _____

6.11.2.2 At approximately 2 hour intervals after pressurization of Containment begins, and until after obtaining the final data of the verification test period, secure readings for all concerned Penetration manifold areas and record on Data Sheets, #1 and #2. _____

NOTE: A flow rate of 7200 SCFM will pressurize Containment at a rate approximately equal to 6.5 psig/hour.

6.11.2.3 Adjust air reducing valve PCV 15468 to throttle open PCV 7439 and slowly admit air to Containment. _____

6.11.2.4 Start up additional compressor(s) only upon instructions from the ILRT Test Coordinator. _____

6.11.3 Adjust air flow to Containment to desired rate, staying within the capacity of the number of compressors running and a flow rate of approximately 7200 SCFM. _____

6.11.4 Upon reaching a Containment pressure of approximately 10 psig, the ILRT Test Coordinator shall dispatch an inspection team to conduct a comprehensive Containment external inspection, for the purpose of identifying any leaks. _____

CAUTION: In order to prevent overshoot of the Hold Point limits in the next step, at a Containment pressure of approximately 14 psig, begin removing air compressors as necessary and controlling air flow rate with PCV 7439.

6.11.4.1 Upon reaching a Containment pressure of 15 psig, ± .25 psig, the ILRT Test Coordinator shall maintain this pressure for approximately one hour to allow Structural Engineering to perform radial displacement measurements. _____

6.11.4.2 Structural Engineering has notified ILRT Test Coordinator that measurements are complete. _____

6.11.4.3 Containment pressurization may continue. _____

6.11.4.4 Re-establish air flow rate of approximately 7200 SCFM. _____

6.11.5 Should a leak exist that may exceed La and the Test Coordinator feels further investigation inside Containment is warranted, stop pressurization and assemble the following inspection team consisting of the groups listed, otherwise mark steps 6.11.5 through 6.11.8 inclusive N/A:

6.11.5.1 Instrument and Control _____

6.11.5.2 Electrical _____

6.11.5.3 Pipefitters _____

6.11.5.4 Machinists _____

6.11.5.5 Operations _____

6.11.5.6 Results and Test _____

6.11.6 Request Health Physics Dept. to initiate Containment Entry procedures to allow assigned personnel to conduct an inspection. The inspection groups will meet to discuss their responsibilities. _____

6.11.7 Upon completion of the Containment inspection(s), the inspection team(s) will meet briefly to discuss their findings. The decision to continue with the test will be the responsibility of the ILRT Test Coordinator. _____

6.11.8 Start air flow to Containment and place in service the required number of compressors. _____

NOTE: During the next step remove ILRT compressors from service consistent with the reduced air flow.

6.11.9 Upon reaching Containment pressure of approximately 33 psig, reduce rate of air flow into Containment to approach the desired ILRT test pressure (35 psig) gradually, thereby permitting temperature and pressure to stabilize without excessive overshoot. _____

6.11.10 When Containment pressure is a minimum of .3 psig above test pressure of 35 psig, as read on ILRT pressure gauge(s), CLOSE Containment Air Test Inlet Isol. valve MOV-7443. _____

6.11.10.1 CLOSE Air Dryer outlet valve 7435. _____

6.11.10.2 Depressurize air supply header via vent valve 7437 upstream of PCV 7439 and permit vent valve 7437 to remain "OPEN". _____

6.11.10.3 Notify Control Room that pressurization is complete. _____

6.11.11 Verify that the air pressure inside Containment, based upon the ILRT pressure instruments, is above 35 psig. _____

6.11.12 Initiate logging of outside weather parameters on Meteorological Data Sheet #3 at less than or equal to 1 hour intervals throughout the test. _____

6.11.13 Notify Structural Engineering to perform radial displacement measurements. _____

6.11.14 Permit the Containment Building contents to attain temperature stabilization in accordance with ANS 56.8, Section 5.3.1 or Bechtel Topical Report BN-TOP-1, Section 2.3 as indicated below. Stabilization may take longer than four hours: (Mark method not used N/A).

6.11.14.1 ANS 56.8: The latest rate of change of the weighted average Containment air temperature, averaged over the last hour, does not deviate by more than 0.5° F/hr from the average rate of change of the weighted average Containment air temperature averaged over the last four hours. _____

6.11.14.2 BN-TOP: Once the Containment is at test pressure the Containment atmosphere shall be allowed to stabilize for approximately four hours. The atmosphere is considered stabilized when:

(Indicate criteria used by initialing and mark other criteria N/A)

1. The rate of change of average temperature is less than 1.0°F/hour averaged over the last two hours. _____

or

2. The rate of change of temperature changes less than 0.5°F/hour/hour averaged over the last two hours. _____

6.12 TYPE "A" TEST PERIOD:

6.12.1 Upon reaching stabilized conditions, secure a line of initial pressure and temperature data. Ensure that Containment Building pressure is ≥ 35 psig when starting this phase of test. _____

NOTE: Initial data (time zero) to be taken exactly on the hour, or as directed by the ILRT Test Coordinator.

6.12.2 Notify Structural Engineering representative to perform applicable portions of RSSP-6.5. _____

NOTE 1: It may be desirable to acquire data at intervals more frequent than below. This will be at the discretion of the ILRT Test Coordinator. Calculation and plotting of this additional data need not be performed at this time.

NOTE 2: The Test Coordinator will determine the operability status of any sensor.

6.12.3 Continue with recording and data calculation on at least 1 hour intervals for the Type A test period. Maintain graphs of the items listed in step 6.12.4 et al. _____

6.12.4 Graphs of the following will be maintained:

6.12.4.1 Mass weight in Containment vs. time. _____

6.12.4.2 Containment average temperature vs. time. _____

6.12.4.3 Containment dew point temperature vs. time. _____

6.12.4.4 Containment Pressure vs. time. _____

6.12.5 The ILRT Test Coordinator will evaluate the data and calculated leak rate to determine interim acceptability of the data for the Type "A" Test period IAW procedure Test Requirements.

_____

Mass Point: _____ L.S.F.

_____ 95% U.C.L.

Total Time: _____ L.S.F.

_____ 95% U.C.L.

6.13 VERIFICATION TEST:

NOTE: If CAM alarms after initiating the known leakage rate in the next step, terminate release and obtain sample for evaluation of radioactivity level.

6.13.1 Ensure a CAM has been set up in vicinity of ILRT Panel by HP Dept. and is operating.

_____

6.13.2 Upon receiving permission from the ILRT Test Coordinator a known additional leakage rate (approx. equal to L_T) is to be established through the test flowmeter.

_____

NOTE: See Attachment B for calculation.

6.13.3 Data collection and calculations as well as the graphs of step 6.12.4 are to be maintained for at least the next 4 hours or half the Type A test duration if the Total Time method is used for test termination. Observe the frequency of step 6.12.3.

_____

6.13.4 The ILRT Test Coordinator will evaluate the data and interim acceptability of the Type A test using the following formula:

_____

$$(L_o + L_{tm} - 0.25\ L_t) \leq L_c \leq (L_o + L_{tm} + 0.25\ L_t)$$

where: L_o = Superimposed leakage rate between 75 and 125% of L_t

L_{tm} = Type A results

L_c = Verification test results

6.14 DEPRESSURIZATION PERIOD:

6.14.1 Notify Structural Engineering to prepare for taking radial displacement measurements.

6.14.2 Establish communications with Control Room to ensure personnel are available to maintain RCS Level control as per steps 4.0 to 4.1 of Attachment E.

6.14.3 The Containment atmosphere will be exhausted to outside atmosphere through the ILRT depressurization lines (MOV 7444) (AOV 7445 and 7478) and (Test valve at Penetration #2, if installed) as follows:

6.14.3.1 Using the control switch at the ILRT Instrument Panel, slowly throttle Open MOV 7444 until a flow rate of approximately 7 psig/hour (not to exceed 10 psig/hour) is established.

CAUTION: Prior to removing Test Tags from drains or vent valves, ensure that these valves are closed and capped/flanged.

6.14.3.2 Initiate re-alignments utilizing RSSP-6.1, 6.2 and 6.3 as directed by the ILRT Test Coordinator.

CAUTION: In order to prevent overshoot of the Hold Point limits in the next step, at a Containment pressure of approximately 16 psig begin throttling MOV 7444 closed.

6.14.3.3 Upon reaching a Containment pressure of 15 psig, ± .25 psig, MOV 7444 shall be closed to maintain this pressure for approximately one hour to allow Structural Engineering to perform radial displacement measurements.

6.14.3.3.1 Structural Engineering has notified ILRT Test Coordinator that measurements are complete.

6.14.3.4 Throttle Open MOV 7444 to re-establish a flow rate of approximately 7 psig/hour (not to exceed 10 psig/hour).

CAUTION: Establish temporary personnel safety barriers prior to next step.

NOTE: If temporary test valve not installed, mark step 6.14.3.5 inclusive N/A.

6.14.3.5 When Depressurization flow rate can no longer be maintained at ≈7 psig/hour through MOV 7444 perform the following to align temporary test valve:
(Mark these steps N/A if path not to be used)

6.14.3.5.1 Open vent valve on blank flange downstream of temporary Test valve at Penetration #2 to release any trapped air pressure. _____

6.14.3.5.2 Request Pipefitters to remove blank flange. _____

6.14.3.5.3 Slowly start opening temporary Test valve at Penetration #2. _____

6.14.3.6 To allow re-establishing Instrument Air to Containment and opening Depressurization flow path AOV 7478 and 7445, perform the following:
(Mark these steps N/A if path not to be used)

6.14.3.6.1 Close V5410B, IA Isol, and replace tubing cap. _____

6.14.3.6.2 Open V5397, Inst. Air Cnmt. Isol. _____

6.14.3.6.3 Place control switch for AOV 834B to the Open position. _____

NOTE: This will close temporary vent path for Instrument Air line downstream of CV 5393.

6.14.3.6.4 Reset Containment Isolation Signal at MCB. _____

6.14.3.6.5 Reset AOV 5392 at the Containment Isolation Auxiliary Relay Panel (Train A & B). _____

6.14.3.6.6 Reset AOV 7445 (Train A) at the Containment Isolation Auxiliary Relay Panel. _____

6.14.3.6.7 Reset AOV 7478 (Train B) at the Containment Isolation Auxiliary Relay Panel. _____

6.14.3.6.8 When Containment pressure is at ≈3 psig open AOV 7445 and AOV 7478 to provide an additional vent path to atmosphere. _____

6.14.4 Notify the Shift Supervisor when depressurization of Containment has been completed. _____

6.14.5 Notify Structural Engineering Representative when depressurization of Containment has been completed to complete RSSP-6.5 and final radial displacement measurements.

_____

6.15 Close the following States blocks which were opened in step 6.10.4.

CI-A2 Cabinet (Rear)

TB-1 States Block #61 MOV 7443 Closed _____
Verified _____

TB-1 States Block #65 MOV 7444 Closed _____
Verified _____

CI-B2 Cabinet (Rear)

TB-1 States Block #61 MOV 7443 Closed _____
Verified _____

TB-1 States Block #65 MOV 7444 Closed _____
Verified _____

6.16 Inform Operations that systems are available for alignment compatible with anticipated Plant operation.

_____

6.17 Notify Operations to insure all affected valves and equipment on Containment Isolation Reset Panel have been reset. _____

6.18 Notify Fire Protection that fire system Z-16 must be reconnected for return to service.

_____

6.19 ILRT Events Log may be terminated at this time. This record must be attached to completed RSSP-6.0.

_____

6.20 Obtain the following post test levels and record on Attachment D. Net changes in these levels will be evaluated for their effect on Containment free volume and the necessity to apply corrections to the final test results:

6.20.1 CONTAINMENT SUMP A LEVEL - MCB Indicators.
LI 2039 _____

LI 2044 _____

6.20.2 CONTAINMENT SUMP B LEVEL - Dip stick method.
_____

6.20.3 PRESSURIZER COLD CALIBRATION LEVEL - MCB Indicator:
LI 433 _____

6.20.4 REACTOR COOLANT DRAIN TANK LEVEL - WDP.
LI 1003 _____

6.20.5 PRESSURIZER RELIEF TANK LEVEL - MCB Indicator.
LI 442 _____

COMMENTS:

COMPLETED BY: _____

DATE COMPLETED: _____

HEAD CONTROL OPERATOR: _____

SHIFT SUPERVISOR: _____

RESULTS & TEST REVIEW: _____ DATE: _____

ATTACHMENT "A"

INSTRUMENTATION CALIBRATION DATA

EQUIPMENT	CALIBRATION DATE

ATTACHMENT "B"

VERIFICATION TEST

1) From the Containment Mass, estimate the induced flow of L_T in terms of pounds per minute.

   Example: (257,323 x .001528) ÷ 1440 = .273 lbs/min

2) Convert pounds per minute to SCFM.

   Example: .273 ÷ .07517 = 3.63 SCFM

3) Induce approximately that flow on the flowmeter through valve adjustments.

   NOTE: The tolerance is ± 25% from previous example: between 2.72 to 4.54 SCFM.

ATTACHMENT C

TEST TAG PREPARATION LOG LIST:

DEVICE	LOCATION	AS FOUND	TEST POSITION	HUNG	CLEARED
V-886A	"A" ACCUM IN CNMT		OPEN - FLANGE REMOVED		
V-886B	"B" ACCUM IN CNMT		OPEN - FLANGE REMOVED		
V-535	PRESSURIZER		OPEN - FLANGE REMOVED		
PCV-430	PRESSURIZER		OPEN (BLOCKED)		
PCV-431C	PRESSURIZER		OPEN (BLOCKED)		
PQ-945	RELAY ROOM		FUSE PULLED		
PQ-946	RELAY ROOM		FUSE PULLED		
PQ-947	RELAY ROOM		FUSE PULLED		
PQ-948	RELAY ROOM		FUSE PULLED		
PQ-949	RELAY ROOM		FUSE PULLED.		
PQ-950	RELAY ROOM		FUSE PULLED		
V-5397	PEN-310a, INT. N		CLOSED - ARFT		
V-5410	PEN-310a, INT. N		OPEN		
V-5410A	PEN-310a, INT. N		OPEN		
V-5410B	PEN-310a, INT. N		OPEN - CAP REMOVED, ARFT		
V-5394	PEN-310a, IN-CNMT		OPEN		
V-5395	PEN-310a, IN-CNMT		CLOSED (CAPPED)		
V-7440	PEN-317, INT. N		OPEN-ARFT		
MOV-7443	PEN-317, INT. N		CLOSED-ARFT		
V-7435	TURB. BLDG. BSMT.		CLOSED-ARFT		
V-7437	PEN-317, INT. N		OPEN		
Temp Test Vlv.	PEN-2; BY EQUIP. HATCH		ARFT		

ATTACHMENT D

CONTAINMENT LEVELS

		PRE-TEST	POST TEST
1)	Containment Sump A		
	(LI 2039)	_____	_____
	(LI 2044)	_____	_____
2)	Containment Sump B		
	(Dip Stick)	_____	_____
3)	Pressurizer Cold Cal.		
	Level (LI-433)	_____	_____
4)	Reactor Coolant Drain		
	Tank (LI-1003)	_____	_____
5)	Pressurizer Relief Tank		
	(LI-442)	_____	_____

COMPLETED BY: _____

DATE COMPLETED: _____

1.0 PURPOSE:

Provide Operations with a means of filling the RCS to a Pressurizer level of ≤ 50%, and maintaining Pressurizer level in a band of 30-50% while Containment is under pressure testing.

1.1 Initial Conditions:

1.1.1 RSSP-6.0 has been started. _____

1.1.2 Hose has been attached to Reactor Head Vent valve and directed to the lower cavity.
Hose Attached to V-500A _____

1.1.3 At least one PORV is Blocked Open, or Pressurizer Manway is removed. (N/A options that do not apply)

PRZR PORV PCV-431C Blocked Open _____
PRZR PORV Block VLV MOV-515 Open _____
PRZR PORV PCV-430 Blocked Open _____
PRZR PORV BLOCK VLV MOV-516 Open _____
Pressurizer Manway Removed _____

1.1.4 RHR in normal cooling alignment. _____

2.0 INITIAL VALVE ALIGNMENT:

2.1 Pressurizer:

2.1.1 Open lower isolation valve to LT-426.
V-534 Open _____

2.1.2 Open lower isolation valve for LT-427.
V-509 Open _____

2.1.3 Close AND cap valve for LT-427.
V-509A Closed _____
V-509A Capped _____

2.1.4 Open lower isolation valve for LT-428 and LT-433.
V-511 Open _____

2.1.5 Close AND cap drain valve for LT-428 and LT-433.
V-511A Closed _____
V-511A Capped _____

2.1.6 Open upper isolation valve for LT-428 and LT-433 and PT-431.
V-512 Open _____

2.1.7 Open level column vent valve.
V-537 Open _____

2.1.8 Open upper isolation valve for LT-427 and PT-430.
V-510 Open _____

2.1.9 Open level column vent valve.
V-536 Open _____

2.1.10 Open upper isolation valve for LT-426, PT-429 and PT-449.
V-533 Open _____

2.1.11 Open isolation valve for PT-430.
V-12425 Open _____

2.1.12 Open level control vent valve.
V-549C Open _____

2.1.13 Reactor Head:

2.1.13.1 Open or lock open Reactor Vessel Head Vent valves.
V-500 Locked Open _____
V-500A Open _____

2.2 RWST to RHR suction fill alignment:

2.2.1 Stop Refueling Water Purification Pump. _____

2.2.2 Close inlet isolation to NRHX.
V-204A Closed _____

2.2.3 Close Refueling Water Purification Pump discharge isolation valve.
V-810 Closed _____

2.2.4 Close Letdown suction isolation valve to Refueling Water Purification Pump.
V-820 Closed _____

2.2.5 Close suction block valve to Refueling Water Purification Pump.
V-824 Closed _____

2.2.6 Close Letdown Deborating DI A&B outlet isolation valve to Letdown DI Filter.
V-247 Closed _____

2.2.7 Close Letdown DI Filter drain valve to WHT.
V-251 Closed _____

2.2.8 Close Letdown DI Filter outlet valve.
V-253 Closed _____

2.2.9 Close Letdown DI Filter bypass valve.
V-250 Closed _____

2.2.10 Open inlet block valve to Letdown DI Filter.
V-249 Open _____

2.2.11 Open inlet block valve to PCV-135.
V-204C Open _____

2.2.12 Open PCV-135 outlet block valve.
V-204E Open _____

2.2.13 Open Letdown DI Filter outlet block valve to RHR Pump suction.
V-252 Open _____

2.2.14 Place TCV-145 to the Divert position.
(MCB) TCV-145 in Divert Position _____

2.2.15 Place PCV-135 in Manual Open.
(MCB) PCV-135 In Manual _____
(MCB) PCV-135 Open _____

2.2.16 Open Refueling Water Purification Pump discharge isolation valve to CVCS.
V-819 Open _____

2.2.17 Open Refueling Water Purification Pump discharge isolation valve to CVCS.
V-821 Open _____

2.3 Ensure MOV-857A, 857B, and 857C are operable and closed.
MOV-857A Closed _____
MOV-857B Closed _____
MOV-857C Closed _____

2.4 Open RWST outlet to CNMT Spray & Safety Injection Pumps MOV's.

MOV-896A Open _____
MOV-896B Open _____

2.5 Ensure MOV-856 is operable. _____

2.6 Perform the following to fill Pressurizer to < 50% WHEN directed by Shift Supervisor or Test Coordinator.

2.6.1 Establish CONTINUOUS communications with AO at MOV-856.

Communications Established _____

2.6.2 Locally throttle open MOV-856 to desired fill rate.

MOV-856 Open _____

2.6.3 Station an AO with a Locked Valve Key near top of Cavity to perform the next step BEFORE 20% Pressurizer level, (30" cold calibrated), is reached.

Locked Valve Key Obtained _____
AO Stationed at the Cavity _____
Pressurizer Level (< 20% NR) _____

2.6.4 WHEN a steady stream of water comes out, THEN close the Reactor Vessel vent.

V-500A Closed _____

2.6.5 Close the following Loop A Refueling Level Indicator manual isolation valves.

2.6.5.1 Loop A outer isolation valve to Refueling Level Indicator.

V-523 Closed _____

2.6.5.2 Loop A inner isolation valve to Refueling Level Indicator.

V-524 Closed _____

2.6.5.3 Loop A Tygon Hose Connection valve.

V-525 Closed _____

2.7 WHEN Pressurizer level reaches just less than 50%, THEN shut MOV-856 electrically.

MOV-856 Closed _____

NOTE: Careful coordination between Control Room and the Test Coordinator is needed to maintain Pressurizer level between 40-50% while CNMT is being pressurized/depressurized due to fill/dewatering rates achievable.

NOTE: During Containment pressurization the suction pressure for the RHR pumps will increase to a point where it will exceed the elevation head from the RWST. The Refueling Water Purification Pump will provide the additional pump head to allow filling from the RWST. If the RWPP should fail, or at any time pressurizer level cannot be maintained within the required band, notify the ILRT Test Coordinator to stop the Containment pressure increase. If level cannot be recovered, depressurize Containment to allow filling from the RWST through MOV 856.

3.0 When level makeup is required during Containment pressurization, then have AO locally throttle open MOV-856 to desired fill rate. _____

3.1 When level makeup through MOV-856 is no longer possible, then have the auxiliary operator perform the following:

3.1.1 Open RWST suction isolation to Refueling Water Purification Pump.

V-808 Open _____

3.1.2 Open Letdown DI Filter isolation valve to RHR Pumps suction.

V-822A Open _____

3.1.3 Start Refueling Water Purification Pump as directed by Control to maintain Pressurizer level between 40-50%.

Refueling Water Purification Pump Started _____

3.1.4 Close MOV-856. _____

****

CAUTION: **WHEN draining to <20% Pressurizer level, realign Refueling Level Indication that was isolated in step 2.6.5.**

CAUTION: **Observe that RHR total flow through FI-626 and FI-931B do not exceed 1500 GAL/MIN per pump.**

****

4.0 IF dewatering is necessary due to CNMT depressurization, THEN coordinate with AO to manually throttle open MOV-857B to lower Pressurizer level to desired level.

MOV-857B Throttled Open _____

4.1 WHEN desired level is reached, THEN close MOV-857B electrically.

MOV-857B Closed _____

ATTACHMENT F

AS-FOUND VERSUS AS-LEFT MINIMUM PATHWAY LEAKAGE RATE

PTT PROC. NO.	AS-FOUND	AS-LEFT	DIFFERENCE
23.1			
23.2			
23.3			
23.5A			
23.5B			
23.6			
23.8			
23.9A			
23.9B			
23.10			
23.11			
23.12A			
23.12B			
23.12C			
23.13A			
23.13B			
23.14			
23.15			
23.16A			
23.16B			
23.17A			
23.17B			
23.17C			
23.18A			
23.18B			
23.19			

(1) "AS-FOUND" is the first LLRT result after plant shutdown.
(2) "AS-LEFT" is the last LLRT result after all maintenance repairs, or just prior to performance of the ILRT.

COMPLETED BY:_____ DATE:_____

ATTACHMENT F

AS-FOUND VERSUS AS-LEFT MINIMUM PATHWAY LEAKAGE RATE

PTT PROC. NO.	AS-FOUND	AS-LEFT	DIFFERENCE
23.20			
23.21			
23.22			
23.23			
23.24			
23.26			
23.27			
23.28			
23.29			
23.30			
23.32			
23.33			
23.34			
23.35.1			
23.36.1			
23.39			
23.40			
23.42			
23.43			
23.44			
23.45			

(1) "AS-FOUND" is the first LLRT result after plant shutdown.
(2) "AS-LEFT" is the last LLRT result after all maintenance repairs, or just prior to performance of the ILRT.

COMPLETED BY:_____ DATE:_____

AS-FOUND VERSUS AS-LEFT MINIMUM PATHWAY LEAKAGE RATE

PTT PROC. NO.	AS-FOUND	AS-LEFT	DIFFERENCE
23.46			
23.49			
23.50A			
23.50B			
23.50C			
23.51A			
23.51B			
23.51C			
23.52			
23.53.1			
23.53.2			
23.54			
TOTAL			

(1) "AS-FOUND" is the first LLRT result after plant shutdown.
(2) "AS-LEFT" is the last LLRT result after all maintenance repairs, or just prior to performance of the ILRT.

COMPLETED BY:_____ DATE:_____

ATTACHMENT G

TYPE A TEST RESULTS		
MASS POINT	**AS FOUND % Weight/Day**	**AS LEFT % Weight/Day**
Least Squares Fit Leak Rate (L_{am})		
95% UCL Leak Rate		
LLRT (Type B & C) Adjustments		
Other Adjustments (Repaired Valve Leakage		
Total (Lines 2, 3, & 4)		
TOTAL TIME		
Least Squares Fit Leak Rate (L_{am})		
95% UCL Leak Rate		
LLRT (Type B & C) Adjustments		
Other Adjustments (Repaired Valve Leakage)		
Total (Lines 2, 3, & 4)		

DATA SHEET #1

OUTER CONTAINMENT AREA PRESSURE READINGS

		DATE/TIME											
		____	____	____	____	____	____	____	____	____	____	____	____
P R E S S U R E	MECH MANIFOLD B PI 2292												
	MECH MANIFOLD A PI 2291												
	MECH MANIFOLD C PI-16												
	MECH MANIFOLD I PI 2281												
	EQUIP HATCH PI 2223												

COMPLETED BY: _____ DATE: _____

DATA SHEET #2

INNER AUXILIARY AREA PRESSURE READINGS

		DATE/TIME											
		___	___	___	___	___	___	___	___	___	___	___	___
PRESSURE	PERSONNEL HATCH PI 2936												
	MECH MANIFOLD D PI 2285												
	MECH MANIFOLD E PI 8												
	MECH MANIFOLD H PI 3												
	MECH MANIFOLD F PI 2282												
	MECH MANIFOLD G PI 2286												
	MECH MANIFOLD J PI 6												
	MECH MANIFOLD K PI 6083												

COMPLETED BY: _____ DATE: _____

DATA SHEET #3

METEOROLOGICAL DATA

	DATE/TIME											
	____	____	____	____	____	____	____	____	____	____	____	____
BAROMETRIC PRESSURE												
TEMPERATURE												
WEATHER CONDITIONS												

COMPLETED BY: _____ DATE: _____

No : 93:104 A-805:17

FIGURE #4

CONSUMABLE MATERIAL CONTROL SYSTEM
RESTRICTED-USE PERMIT
(CORROSION CONTROL)
GINNA NUCLEAR STATION

Y - APPROVED FOR USE WITH RESTRICTIONS

The following consumable product exceeds the maximum allowable concentration for contaminants. (Dept/Shop) SENSING SYSTEMS CORP requests approval to use the product below for the (Bldg/System) AUX.& INTERMEDIATE BLDG / ILRT SUPPORT repair, maintenance, and/or modification described below:

PRODUCT :LOCTITE FAST CURE EPOXY 45 QUANTITY :

DESCRIPTION OF USE :

TO BE USED TO ATTACH BACK SITES FOR RADIAL DISPLACEMENT MEASUREMENT.

==========

(Chemical Control Coordinator)
RESTRICTIONS FOR USE :

EPOXY IS APPROVED FOR THE ABOVE APPLICATION PROVIDED THE ONLY SURFACES CONTACTED ARE CONCRETE OR STRUCTURAL STEEL. NO CONTACT IS TO BE MADE WITH ANY OTHER SURFACE COMPONENT, OR FLUID SYSTEM. DO NOT STORE OR LEAVE EPOXY UNATTENDED IN PLANT WORK AREAS.

APPROVED BY : Mary Gillen Daughn DATE: 4/3/93
(Chemical Control Coordinator)

==========

APPENDIX B

RAW DATA

R. E. GINNA NUCLEAR POWER PLANT

Containment Building

Radial Displacement Measurements

Azimuth 40° 42'

DATE D/M/Y	TIME H/M	PRESSURE PSIG		SCALE READINGS (inches) ELEVATION (feet) 260'	288'	315'	337'	
4-11-93	2330	0	52	5.150	4.830	4.822	4.645	51 1/16
4-12-93	0115	0	50	5.150	4.831	4.822	4.645	52/1
4-12-93	0610	15	54	5.182	4.871	4.871	4.686	55/2
4-12-93	0825	≈25	61	5.223	4.928	4.941	4.713	63/0
4-12-93	1103	35	72	5.267	4.981	5.006	4.751	73/0
4-13-93	0948	0	61	5.148	4.831	4.828	4.648	62/2

R. E. GINNA NUCLEAR POWER PLANT

Containment Building

Radial Displacement Measurements

Azimuth 166° 07'

AUX BLDG.

DATE D/M/Y	TIME H/M	PRESSURE PSIG	SCALE READINGS (inches) ELEVATION (feet)			
			260'	288'	315'	337'
APR/11/93	10:35	0	4.980	2.998	3.356	3.568
	17:45 (17:145)	0	4.980	2.999	3.357	3.569
	23:50	0	4.981	2.999	3.358	3.570
APR/12/93	06:10	15	5.018	3.050	3.405	3.585
	08:25	25	5.080	3.123	3.470	3.610
	11:55	35	5.139	3.190	3.532	3.640
APR/13/93	9:00	0	4.982	2.997	3.355	3.560

R. E. GINNA NUCLEAR POWER PLANT

Containment Building

Radial Displacement Measurements

Azimuth 260° 00'

INTERMEDIATE BLDG.
HOT SIDE

DATE D/M/Y	TIME H/M	PRESSURE PSIG	SCALE READINGS (inches)			
			ELEVATION (feet)			
			260'	288'	315'	337'
4/11/93	9:25	0	5.475	5.205	5.665	4.007
	17:15	0	5.476	5.205	5.665	4.009
	23:10	0	5.475	5.205	5.666	4.005
4/12/93	5:50	15	5.506	5.240	5.685	4.010
	11:05	35	5.619	5.345	5.790	4.050
4/13/93	8:30	0	5.472	5.204	5.663	4.000

DATE	TIME	PRESSURE	31V	31H	32V	32H	42	49 (30 SEC)	54	58
4-9-93	1700	0	-968 ✓	+1653 ✓	-352 ✓	-173	-3675 ✓	-2755 ✓	-1475	+4854
4-10-93	10:34	0	-890 ✓	+1724	-323	-115/+131	-3580	-2612	-1415	+4914
	12:10	0	-886/+892	-1726/+1708 R	-320	-113	-3571	-2570 -2620	-1399	+4906
	13:43	0	-883/+888	+1714	-313	-105	-3559	-2700→710	-1387	+4917
4-11-93	10:55	0 40°	-836/+839 ✓	+1790	-219	-48	-3436 ✓	-2600 ~	-1317	+5015
	1507	0 45°	-843/+846 ✓	+1783	-223	-51	-3463	-2430 OL (SPIKES) 2600	-1361 ✓	+4988
	1740	0	-841/+844 ✓	+1788	-224	-51	-3465	-2600 ~	-1375 ✓	+4986
	1159	0	-826/+830 ✓	+1806	-210	-34	-3438	-2440 ✓	-1330	+5006
4-12-93	0620	15	-761/+784 ✓	+1862	-114	+124 ✓	-3364 ✓	-2580	-1253	+5095
~~4-12-93~~	~~06:18~~	~~15~~	~~-770~~							
A-12-93	08:35	≈26 36°	-737/+740 ✓	+1873 ✓	-54	+306 ✓	-3327 ✓	-2600 ~	-1235 ✓	+5158 ✓
A-12-93	1130	35 39°	-712/+716	+1914 ✓	+12 ✓	+562 ✓	-3299 ✓	-2600 ~	-1198 ✓	+5179
4-13-93	0920	0 41°	-818 ✓	+1803 ✓	-192 ✓	-10 ✓	-3437 ✓	-2460 ~	-1390 ✓	5015 ✓

APPENDIX C

CALIBRATION CERTIFICATES

KARA CO., INC.

SURVEYING EQUIPMENT SALES & SERVICE
4400 RIVERSIDE AVE., LYONS, IL 60534
708-442-6010 • In Illinois 800-942-9382 • Fax 708-442-7359

CALIBRATION CERTIFICATE

Instrument submitted by: SENSING SYSTEMS CORP.

Description: BRUNSON 75H S/N 595772

We certify that the above instrument has been calibrated and adjusted to comply with the manufacturers specifications. We further certify that the referenced equipment has been inspected and calibrated with instruments whose basic accuracies are traceable to the National Bureau of Standards. Furthermore, all the tests performed, fully comply with those used by the National Bureau of Standards.

KARA Co., Inc.

By: [signature]

Date: 3.19.93.

N.B.S. No: 738/229329-83

738/223398

KARA CO., INC.

SURVEYING EQUIPMENT SALES & SERVICE
4400 RIVERSIDE AVE., LYONS, IL 60534
708-442-6010 • In Illinois 800-942-9382 • Fax 708-442-7359

CALIBRATION CERTIFICATE

Instrument submitted by: SENSING SYSTEMS CORP.

Description: K&E TI 1026 SIN 405776

We certify that the above instrument has been calibrated and adjusted to comply with the manufacturers specifications. We further certify that the referenced equipment has been inspected and calibrated with instruments whose basic accuracies are traceable to the National Bureau of Standards. Furthermore, all the tests performed, fully comply with those used by the National Bureau of Standards.

KARA Co., Inc.

By: [signature]

Date: 3.19.93

N.B.S. No: 738/229329-83

738/223398

KARA CO., INC.

SURVEYING EQUIPMENT SALES & SERVICE
4400 RIVERSIDE AVE., LYONS, IL 60534
708-442-5010 • In Illinois 800-942-9382 • Fax 708-442-7359

CALIBRATION CERTIFICATE

Instrument submitted by: SENSING SYSTEMS CORP.

Description: K&E 71 1026 S/N 402667

We certify that the above instrument has been calibrated and adjusted to comply with the manufacturers specifications. We further certify that the referenced equipment has been inspected and calibrated with instruments whose basic accuracies are traceable to the National Bureau of Standards. Furthermore, all the tests performed, fully comply with those used by the National Bureau of Standards.

KARA Co., Inc.

By: [signature]

Date: 3-19-93

N.B.S. No: 738/229329-83

738/223398

APPENDIX D

TEST PERSONNEL

Technical Report
50016-7

Test Personnel:

Rochester Gas and Electric Co.

Leonard Sucheski, P.E.
John J. Ferraro, P.E.

Sensing Systems Corporation

LaVerne F. Wallace
Ricardo J. Bermudez