



**Commonwealth Edison**  
1400 Opus Place  
Downers Grove, Illinois 60515

August 23, 1994

Mr. William T. Russell, Director  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Attn: Document Control Desk

Subject: Dresden Nuclear Power Station Units 2 and 3  
Quad Cities Nuclear Power Station Units 1 and 2  
LaSalle County Nuclear Power Station Units 1 and 2  
Commonwealth Edison (ComEd) Response to NRC  
Generic Letter (GL) 94-03, "Intergranular Stress Corrosion Cracking  
of Core Shrouds in Boiling Water Reactors."  
NRC Docket Nos. 50-237/249, 50-254/265, and 50-373/374

Mr. Russell:

The purpose of this letter is to provide the ComEd response to NRC Generic Letter 94-03, "Intergranular Stress Corrosion Cracking of Core Shrouds in Boiling Water Reactors." The details of the response to this Generic Letter for Dresden, Quad Cities and LaSalle are contained in the attachments to this letter.

As stated in the Generic Letter, the NRC has encouraged licensees to follow the guidance developed for this issue by the BWROG (and subsequently the BWR Vessel Internals Project, BWR-VIP). ComEd is committed to the BWR-VIP. ComEd has been and will continue to be an integral part of the BWR-VIP. Dresden, Quad Cities and LaSalle will follow the guidance provided by the BWR-VIP with respect to flaw assessment, inspections, evaluations, and repair options as this guidance is provided, and if it should be subsequently revised. It shall be noted that our response provides reference to these documents and analyses where they are applicable. In referencing these items, it is not intended that they supersede the design basis analysis of record at our plants.

To the best of my knowledge and belief, the statements contained in this document are true and correct. In some respects these statements are not based on my personal knowledge, but on information furnished by other ComEd employees, contractor employees, and/or consultants. Such information has been reviewed in accordance with company practice, and I believe it to be reliable.

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Please address any further comments or questions regarding this matter to this office.

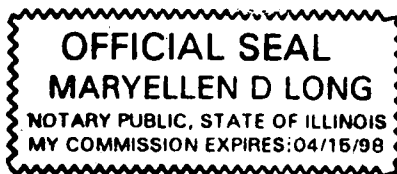
Respectfully,

*Gary G. Benes*

Gary G. Benes  
Nuclear Licensing Administrator

Subscribed and Sworn to before me  
on this 23<sup>rd</sup> day of  
August, 1994.

*Maryellen D Long*  
Notary Public



Attachment A: ComEd Response to GL 94-03  
Attachment B: LaSalle Drawings of the Core Shroud Configuration

cc: J. B. Martin, Regional Administrator - RIII  
J. F. Stang, Project Manager - NRR  
R. M. Pulsifer, Project Manager - NRR  
W. D. Reckley, Project Manager - NRR  
M. N. Leach, Senior Resident Inspector - Dresden  
C. Miller, Senior Resident Inspector - Quad Cities  
P. G. Brochman, Senior Resident Inspector - LaSalle  
Office of Nuclear Facility Safety - IDNS

Attachment A

ComEd Response to GL 94-03

1. **Within 30 days from the date of this generic letter:**

(a) **A schedule for inspection of the core shroud.**

Dresden/Quad Cities: The Dresden Unit 2 core shroud will be inspected or proactively repaired during the next refueling outage (D2R14), which is currently scheduled for March, 1995. The Quad Cities Unit 2 core shroud will be inspected or proactively repaired during the next refueling outage (Q2R13), which is currently scheduled for January, 1995.

The Dresden Unit 3 core shroud was inspected in May, 1994 and will either be reinspected or repaired during the next refueling outage (D3R14), which is currently scheduled for January, 1996. The Quad Cities Unit 1 core shroud was inspected in May, 1994, and will either be reinspected or repaired during the next refueling outage (Q1R14), which is currently scheduled for September, 1995.

If the inspection (or reinspection) option is ultimately chosen, the latest inspection and flaw evaluation guidelines developed by the BWR Vessel and Internals Project (BWR-VIP) prior to the refuel outage will be followed in the performance of the inspections and evaluation of the results.

If the repair option is ultimately chosen, it will comply with the generic repair specification currently being developed by the BWR-VIP.

LaSalle: The LaSalle County Station inspection schedule will follow the latest inspection and flaw evaluation guidelines developed by the BWR-VIP and will be submitted as requested in item 2. (a) below.

(b) **A safety analysis, including a plant-specific safety assessment, as appropriate, supporting continued operation of the facility until inspections are conducted.**

Dresden/Quad Cities: Continued operation of Dresden Unit 3 and Quad Cities Unit 1

until reinspection and/or repairs are performed is supported by the Reference (i) safety evaluation report.

Continued operation of Dresden Unit 2 and Quad Cities Unit 2 is supported by the unit/plant specific safety assessment submitted in Reference (e) coupled with the additional technical information provided in References (a), (b), (c), (d), (f), (g) and (h).

LaSalle: LaSalle County Station has reviewed the BWROG Generic Safety Assessment, of Reference (j). This safety assessment is appropriate for LaSalle Units 1 & 2, and no further specific assessment is required at this time. This conclusion is based on site specific inspection data, physical characteristics and parameters which reduce the likelihood of the existence of significant Core Shroud cracking, and the low probability of a Main Steam Line Break, Reactor Recirculation Line Break, or the Safe Shutdown earthquake.

These factors are listed below:

- With respect to Mean Conductivity for the first five fuel cycles, LaSalle County Station Unit 1 is classified in reference No. 1 as having "Mid-Range Conductivity" with a value of .272 uS/cm. LaSalle County Station Unit 2 has been classified as having "Low Conductivity" with a value of .250 uS/cm. This chemistry performance further reduces the likelihood that Stress Corrosion Cracking (SCC) has initiated and propagated in the LaSalle Core Shrouds.
- The LaSalle Unit 1 & 2 Core Shrouds are fabricated from SA-240 Type 304L Stainless Steel Plate Material. The percent Carbon content of the various plates used in the fabrication ranges from .018% Max. to .028% Max. The specific Carbon content of each plate used in the LaSalle Core Shrouds is shown in the table designated "LaSalle I/II Shroud Data" on the applicable drawing included with this submittal. The relatively low Carbon content of the materials used to fabricate the Core Shrouds for LaSalle reduces the likelihood that SCC exists in the Core Shrouds.
- No cracking was detected during enhanced VT-1 visual examination of the LaSalle Unit 1 Core Shroud in its Spring 1994 refueling Outage. No cracking is expected in the Unit 2 Core Shroud because of similar materials and better

conductivity. The details of the Unit 1 examination are given in item 1.(d) below.

- The number of Hot Operating Years (HOY) for LaSalle County Station Unit 1 is 8.04 as of February 1994, and 8.53 for Unit 2 projected to the scheduled February 1995 refueling outage. These numbers only slightly exceed the 8 HOY threshold value in GENE Services Information Letter 0572 Rev.1.
- No cracking, or other indications of degradation has been detected in the ECCS Spray Piping, or Spargers during In-Vessel Visual Inspection (IVVI) completed each refueling outage in accordance with IE Bulletin No. 80-13.
- No Intergranular Stress Corrosion Cracking (IGSCC) has been detected during examination of the Reactor Recirculation system piping welds in accordance with Generic Letter No. 88-01, or during routine ASME Section XI examinations.
- All Reactor Recirculation piping welds susceptible to IGSCC have been subjected to either Inductive Heat Stress Improvement (IHSI), or Mechanical Stress Improvement (MSIP) processes. This reduces the likelihood that an IGSCC flaw exists in this piping.
- No detrimental service induced indications have been detected during examination of the Main Steam system piping welds during routine ASME Section XI examinations.
- The probability of a large steam or water line LOCA is extremely low ( $3.0E - 04$ /Reactor Year) per Reference (k)
- The probability of a seismic event ranges from  $1.1E-4$ /yr. for a small earthquake to  $1.0E - 6$ /yr. for a large earthquake per Reference (l).
- Training of Control Room Operators to detect operational symptoms resulting from unexpected significant leakage thru the Core Shroud, and to take appropriate actions is being tracked.

The existence of the above mitigating factors, when combined with the low probability of a LOCA, or SSE provide assurance that continued safe operation of LaSalle County Station Unit 1 & 2 is justified until such time as the BWR-VIP recommended examinations can be

completed.

- (c) **A drawing or drawings of the core shroud configuration showing details of the core shroud geometry (e.g., support configurations for the lower core support plate and top guide, weld locations and configurations).**

Dresden/Quad Cities: Drawings of the core shroud configuration of Dresden Units 2 and 3, and Quad Cities Units 1 and 2, which show details of the core shroud geometry, were previously submitted under References (a) and (c).

LaSalle: The drawings listed below are being submitted in response to item 1.c above. Additional information applicable to LaSalle Units 1 & 2 can be found in the Boiling Water Reactor Owners Group (BWROG) document "Responses To NRC Questions On Core Shroud and Reactor Internals", of Reference (m).

**LaSalle Unit 1**

- General Electric Dwg., 105E1347B, *LaSalle I Shroud Data*
- General Electric Dwg., VPF2029-082  
Combustion Engineering Dwg., 232-937, *Shroud Support Details and Assembly*

**LaSalle Unit 2**

- General Electric Dwg., 107E5313G, *LaSalle II Shroud Data*
- General Electric Dwg., VPF3073-17-2, *Shroud Support Stubs & Location*
- General Electric Dwg., VPF3073-18-4, *Shroud Support Plan*
- General Electric Dwg., VPF3073-19-5, *Shroud Support Assembly*

- (d) **A history of shroud inspections for the plant should be provided addressing date, scope, methods and results, if applicable.**

Dresden/Quad Cities: A history of all vessel internal inspections (including the shroud), which addressed the date (outage), scope, methods and results, was previously submitted under Reference (a).

LaSalle: Remote enhanced VT-1 visual examination of the LaSalle Unit 1 Core Shroud was conducted from April 20, 1994 through May 2, 1994.

The examinations were conducted using an ETV-1250 type black-and-white video camera, equipped with adjustable intensity "twin-50" type lighting. When additional lighting was needed, a small 500 watt light capable of being lowered into each fuel cell was used. Resolution capability was checked using a 1 mil wire for all shroud weld examinations.

The shroud examinations included all portions of circumferential welds H1, H2, H3, H4, H5, H6, H7, and H8, which were accessible from the outside of the shroud. The shroud examinations also included portions of the H3 weld at 66, 156, 246, and 336 degrees which were accessible from the inside of the shroud through the cells which were open near those locations. The shroud examinations also included portions of the H4 and H5 welds at 24, 66, 114, 156, 204, 246, 294, and 336 degrees which were accessible from the inside of the shroud through the cells which were open near those locations.

No cracking, or other detrimental indications were detected during this examination.

No examinations in accordance with GENE Services Information Letter (SIL) 0572 Rev.1 have been completed for the LaSalle Unit 2 Core Shroud.

**2. No later than 3 months prior to performing the core shroud inspections:**

**(a) The inspection plan requested above in item 3 of Requested Actions.**

Dresden: Dresden Station will comply with this requirement.

Quad Cities: Quad Cities Station will comply with this requirement.

LaSalle: LaSalle County Station will comply with this requirement.

**(b) Plans for evaluation and/or repair of the core shroud based on the inspection results.**

Dresden: Dresden Station will comply with this requirement.

Quad Cities: Quad Cities Station will comply with this requirement.

LaSalle: LaSalle County Station will comply with this requirement.

**3. Within 30 days from the completion of the inspection, provide the results of the inspection.**

Dresden: Dresden Station will comply with this requirement.

Quad Cities: Quad Cities Station will comply with this requirement.

LaSalle: LaSalle County Station will comply with this requirement.



## REFERENCES

- (a) ComEd letter (M. Lyster) to the NRC (W. Russell), "Dresden Nuclear Power Station Units 2 and 3, Quad Cities Nuclear Power Station Units 1 and 2, Response to Request for Additional Information (RAI)," dated June 6, 1994.
- (b) ComEd letter (M. Lyster) to the NRC (W. Russell), "Dresden Nuclear Power Station Units 2 and 3, Quad Cities Nuclear Power Station Units 1 and 2, Supplemental Response to Request for Additional Information (RAI)," dated June 13, 1994.
- (c) ComEd letter (P. Piet) to the NRC (W. Russell), "Dresden Nuclear Power Station Units 2 and 3, Quad Cities Nuclear Power Station Units 1 and 2, Clarification of Information Related to Commonwealth Edison's (ComEd) Finite Element Analysis Model Related to the Core Shroud Cracking Issue at Dresden and Quad Cities Stations," dated June 30, 1994.
- (d) ComEd letter (P. Piet) to the NRC (W. Russell), "Dresden Nuclear Power Station Units 2 and 3, Quad Cities Nuclear Power Station Units 1 and 2, Commonwealth Edison's (ComEd) Integrated Evaluation Report for the Core Shroud Cracking Issue at Dresden and Quad Cities Stations," dated June 30, 1994.
- (e) ComEd letter (P. Piet) to the NRC (W. Russell), "Dresden Nuclear Power Station Unit 3, Quad Cities Nuclear Power Station Unit 1, Shroud Cracking Issue Response to Request for Additional Information (RAI)," dated July 8, 1994.
- (f) ComEd letter (P. Piet) to the NRC (W. Russell), "Dresden Nuclear Power Station Units 2 and 3, Quad Cities Nuclear Power Station Units 1 and 2, Response to NRC Request for Information on Recirculation Pipe Break," dated July 12, 1994.
- (g) ComEd letter (P. Piet) to the NRC (W. Russell), "Dresden Nuclear Power Station Units 2 and 3, Quad Cities Nuclear Power Station Units 1 and 2, Confirmatory Analysis for Main Steamline Break Related to the Core Shroud Cracking Issue," dated July 15, 1994.
- (h) ComEd letter (P. Piet) to the NRC (W. Russell), "Dresden Nuclear Power Station Units 2 and 3, Quad Cities Nuclear Power Station Units 1 and 2, Clarification of Issues Related to Seismic Inputs for the Core Shroud Cracking Analysis," dated July 20, 1994.

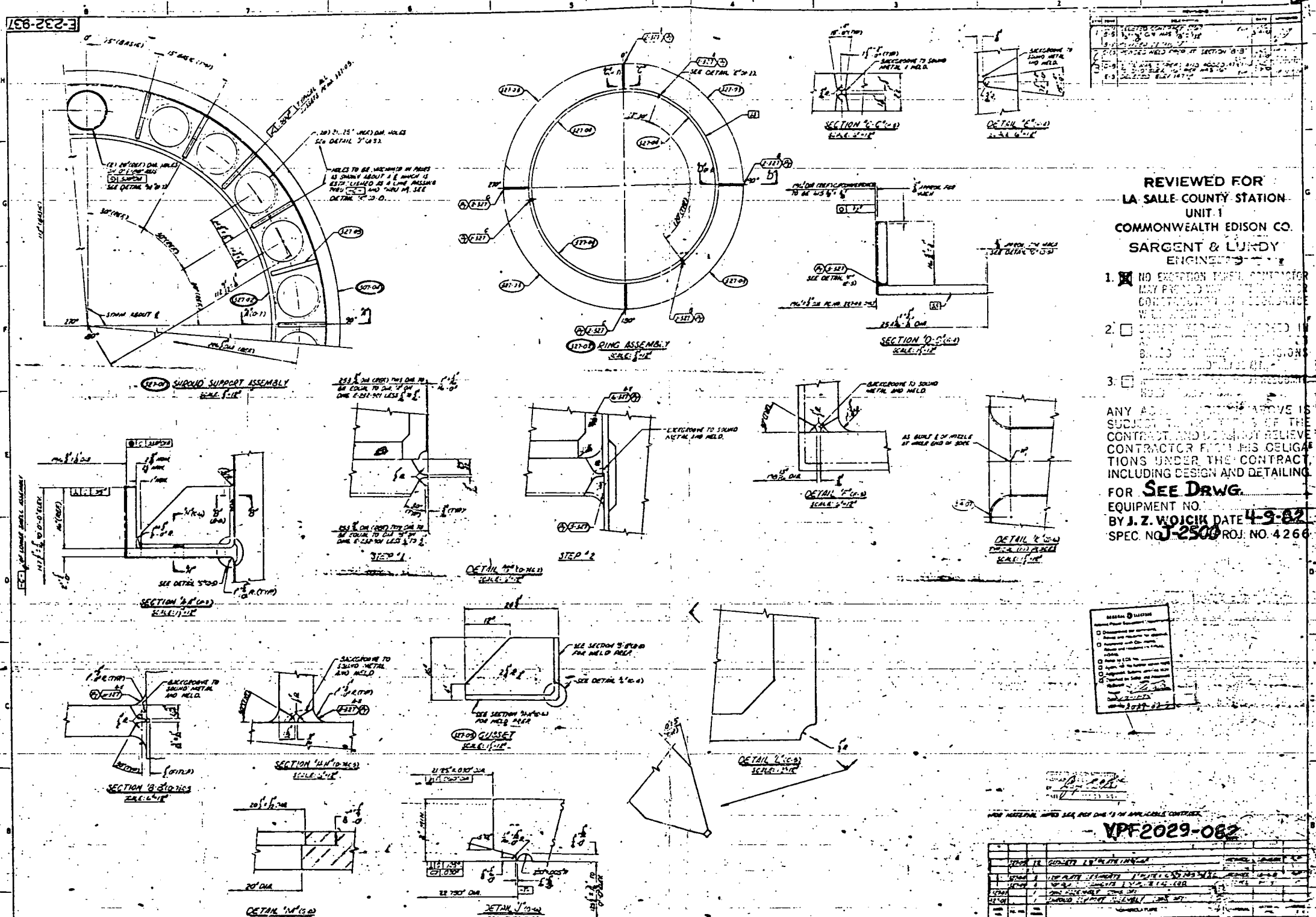
## REFERENCES

(continued)

- (i) NRC letter (J. Stang) to ComEd (D. Farrar), "Resolution of Core Shroud Cracking at Dresden, Unit 3, and Quad Cities, Unit 1," dated July 21, 1994.
- (j) BWROG document GENE-523-A107P-0794, *BWR Shroud Cracking Generic Safety Assessment*, Revision 1, dated August of 1994.
- (k) NUREG/CR-4832, SAND92-0537 Vol. 4, *Analysis of the LaSalle Unit 2 Nuclear Power Plant: Risk Methods Integration and Evaluation Program (RMIEP), Initiating Events and Accident Sequence Delineation.*, dated October of 1992.
- (l) NUREG/CR-4832, UCID-21245 Vol. 8, *Analysis of the LaSalle Unit 2 Nuclear Power Plant: Risk Methods Integration and Evaluation Program (RMIEP), Seismic Analysis.*, dated November of 1993.
- (m) BWROG/VIP document GENE-523-A114P-0894, *Responses to NRC Questions On Core Shroud and Reactor Internals*, dated August of 1994.

**Attachment B**

**LaSalle Drawings of the Core Shroud Configuration**



NO.	DESCRIPTION	DATE
1	ISSUED FOR CONSTRUCTION	4-9-82
2	REVISED WELD PROC. AT SECTION B-B	
3	REVISED WELD PROC. AND ASSOCIATED DIMENSIONS	
4	REVISED WELD PROC.	

REVIEWED FOR  
 LA SALLE COUNTY STATION  
 UNIT 1  
 COMMONWEALTH EDISON CO.  
 SARGENT & LUNDY  
 ENGINEERS

- NO EXCEPTION TOLERANCES MAY BE USED UNLESS SPECIFICALLY NOTED OTHERWISE ON DRAWINGS.
- DIMENSIONS SHOWN ON DRAWINGS TAKE PRECEDENCE OVER DIMENSIONS SHOWN ON FIELD NOTES.
- DIMENSIONS SHOWN ON DRAWINGS TAKE PRECEDENCE OVER DIMENSIONS SHOWN ON FIELD NOTES.

ANY ADDITIONS ABOVE IS SUBJECT TO THE TERMS OF THE CONTRACT AND DOES NOT RELIEVE CONTRACTOR FROM HIS OBLIGATIONS UNDER THE CONTRACT INCLUDING DESIGN AND DETAILING.

FOR SEE DRWG.  
 EQUIPMENT NO.  
 BY J. Z. WOJCIK DATE 4-9-82  
 SPEC. NO. J-2500 PROJ. NO. 4266

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NO.	DATE	DESCRIPTION
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3		REVISED WELD PROC. AND ASSOCIATED DIMENSIONS
4		REVISED WELD PROC.

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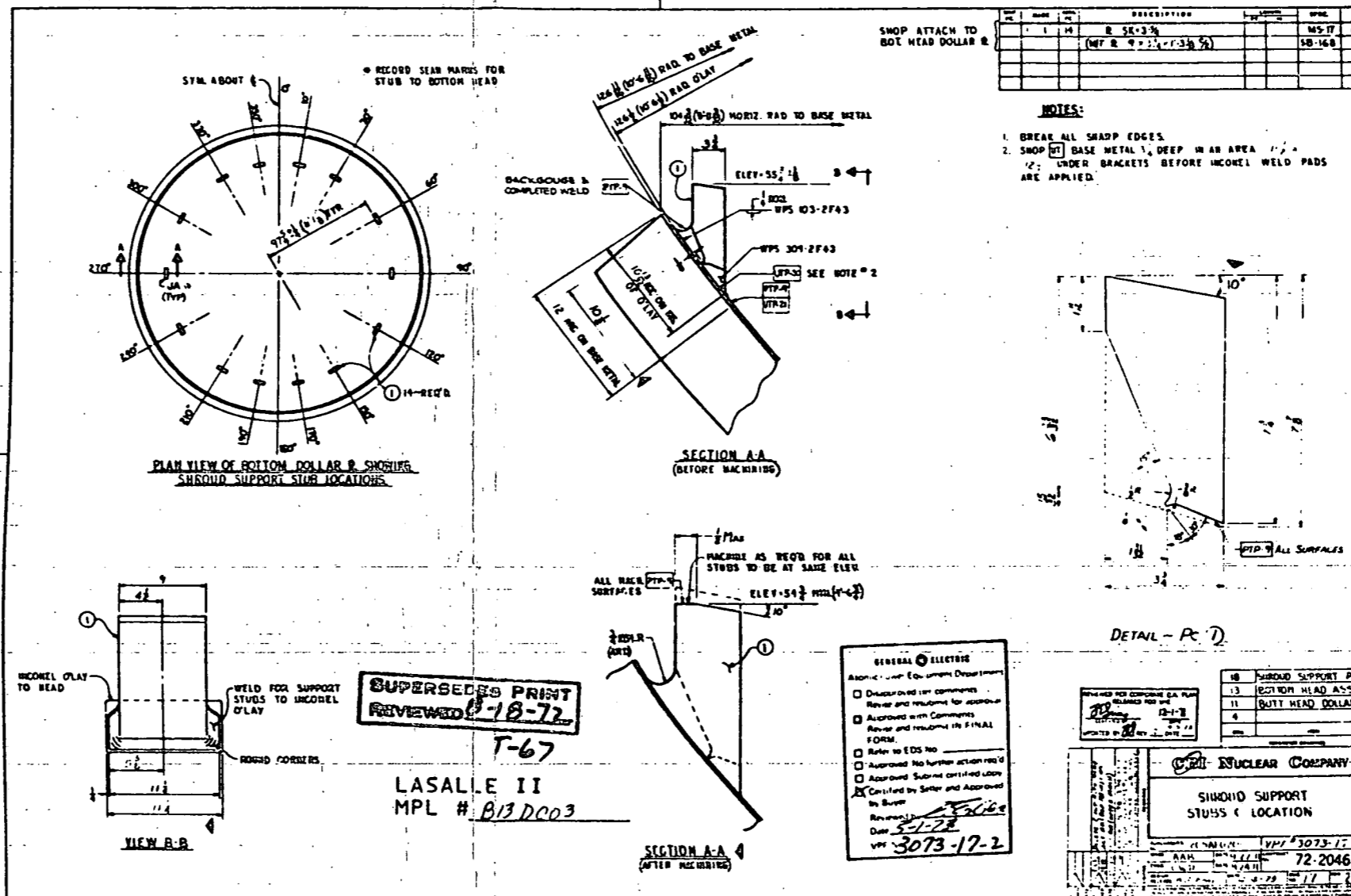
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COMMONWEALTH EDISON CO.  
SARGENT & LUNDY  
ENGINEERS

1.  NO EXCEPTION TAKEN, CONTRACTOR CAN PROCEED WITH FABRICATION OR CONSTRUCTION
2.  CONTRACTOR CAN PROCEED BASED ON MAKING REVISIONS NOTED AND RESUBMIT.
3.  REVISE AS NOTED AND RESUBMIT. HOLD FABRICATION

ANY ACTION SHOWN ABOVE IS SUBJECT TO THE TERMS OF THE CONTRACT, AND DOES NOT RELIEVE CONTRACTOR FROM HIS OBLIGATIONS UNDER THE CONTRACT, INCLUDING DESIGN AND DETAILING.

FOR SHROUD SUPPORT  
EQUIPMENT NO. 2 B13-D003  
BY J. M. FOX DATE 9-4-73  
SPEC. NO. 250 PROJ. NO. 4267

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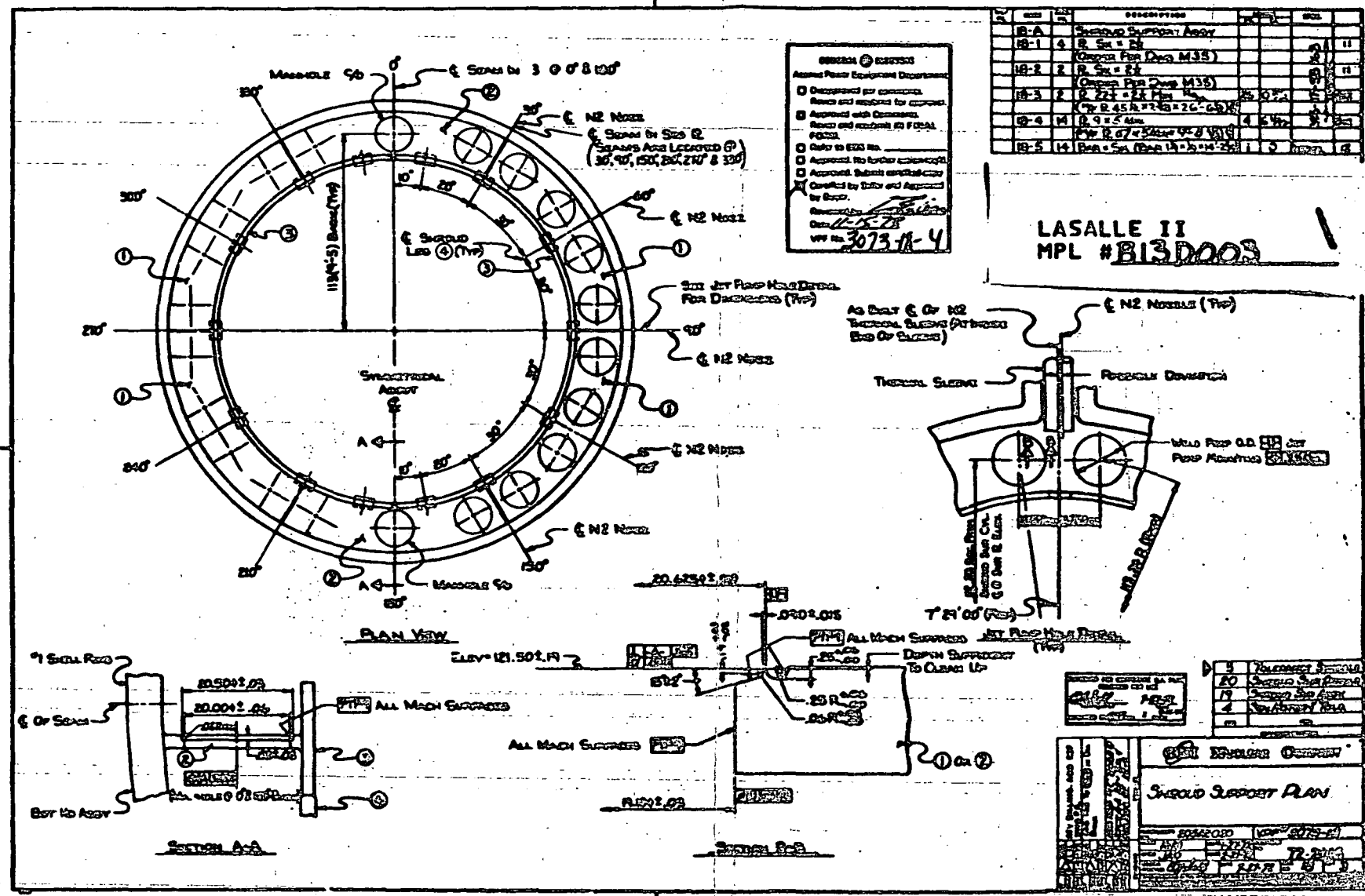
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NO.	REV.	DESCRIPTION	DATE	BY	CHKD.
B-A		Support Assembly			
B-1	4	R. 5x4.5			
B-2	2	Change Plan Draw M35			
B-3	2	Change Plan Draw M35			
B-4	1	R. 2.21 = 2.1 Min			
B-5	1	R. 4.5A, 2.2A = 2.0			
B-6	1	R. 9 = 5 Min			
B-7	1	R. 6.7 = 2.2			
B-8	1	R. 5.4 (R. 5.4 = 5.4)			

**REVISIONS**  
 Approved Power Equipment Department  
 Designated for comments.  
 Review and approval for approval.  
 Approved with Comments.  
 Rejected and resubmit to FIELD OFFICE.  
 Refer to 620.0.  
 Approved. No further action.  
 Approved. Submit and copy.  
 Certified by Title and Approved by Supr.  
 Date: 11-29-73  
 VPF No. 3073-18-4

**LASALLE II**  
**MPL #B13D003**

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**SARGENT & LUNDY**  
 ENGINEERS

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ANY ACTION SHOWN ABOVE IS SUBJECT TO THE TERMS OF THE CONTRACT, AND DOES NOT RELIEVE CONTRACTOR FROM HIS OBLIGATIONS UNDER THE CONTRACT, INCLUDING DESIGN AND DETAILING.  
 FOR **SHROUD SUPPORT PLAN**  
 EQUIPMENT NO. 2 B13-D003  
 BY E. H. FOX DATE 11-29-73  
 SPEC. NO. J-250 PROJ. NO. 1289

SUPERSEDES PRINT  
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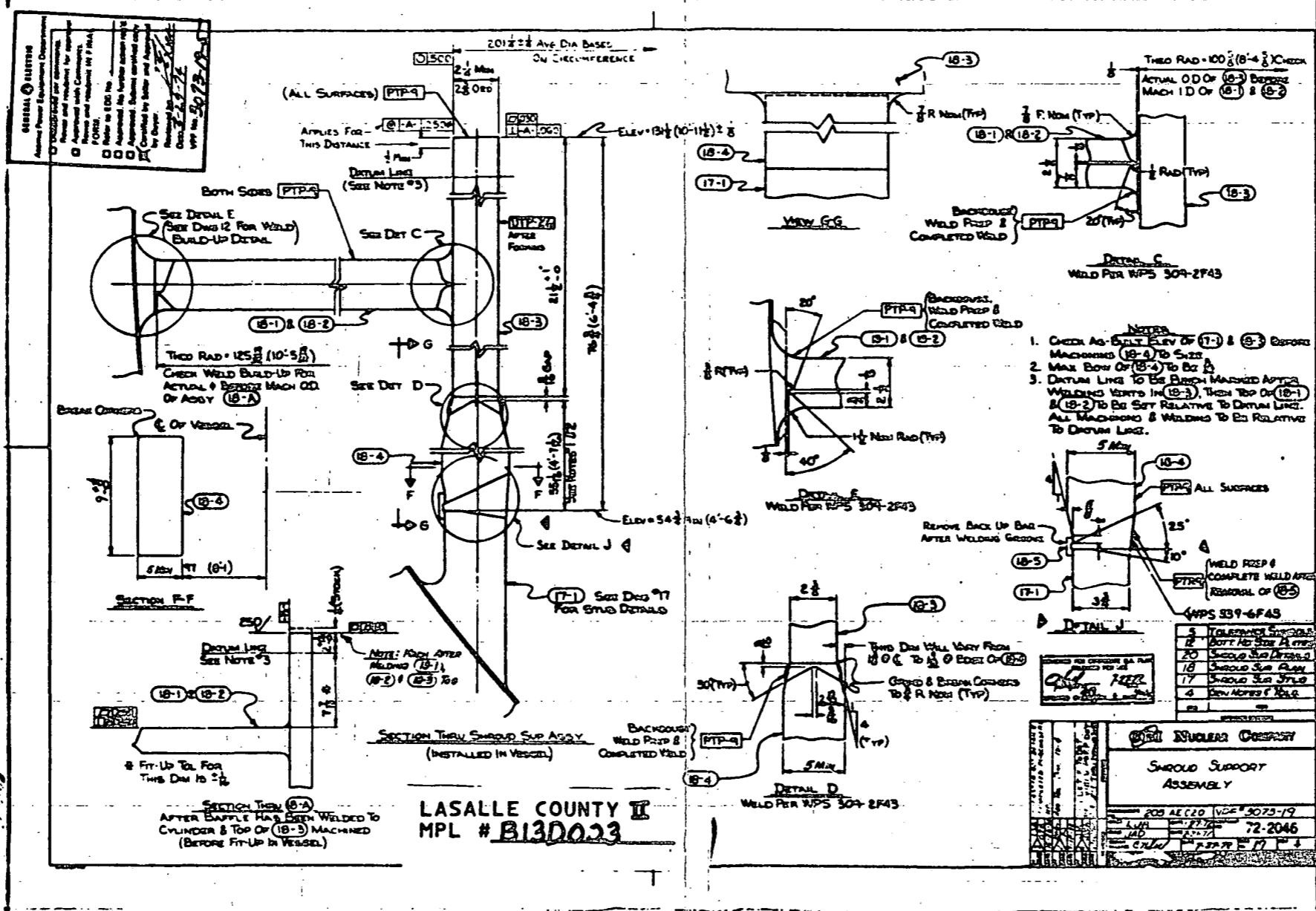
REVIEWED FOR  
LA SALLE COUNTY STATION  
UNIT 2  
COMMONWEALTH EDISON CO.  
SARGENT & LUNDY  
ENGINEERS

1.  NO EXCEPTION TAKEN, CONTRACTOR CAN PROCEED WITH FABRICATION OR CONSTRUCTION.
2.  CONTRACTOR CAN PROCEED BASED ON MAKING REVISIONS NOTED AND RESUBMIT.
3.  REVISE AS NOTED AND RESUBMIT. HOLD FABRICATION.

ANY ACTION SHOWN ABOVE IS SUBJECT TO THE TERMS OF THE CONTRACT, AND DOES NOT RELIEVE CONTRACTOR FROM HIS OBLIGATIONS UNDER THE CONTRACT, INCLUDING DESIGN AND DETAILING.

FOR SHROUD SUP. ASM.  
EQUIPMENT NO. L B13-0003  
BY J. M. FOX DATE 7-31-73  
SPEC. NO. J-2500 PROJ. NO. 4267

T-653



LASALLE COUNTY II  
MPL # B130023

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