

June 2, 1988

Docket No. 50-260

LICENSEE: Tennessee Valley Authority

FACILITY: Browns Ferry Nuclear Power Station, Unit 2

SUBJECT: MAY 11, 1988 MEETING WITH THE TENNESSEE VALLEY (TVA) TO DISCUSS  
THE BROWNS FERRY RESPONSE TO GENERIC LETTER 88-01 AND INTERGRANULAR  
STRESS CORROSION CRACKING (TAC NO. 62263)

On May 11, 1988, members from the Office of Special Projects met with the staff of Tennessee Valley Authority (TVA or the licensee) to discuss TVA's response to Generic Letter 88-01 (GL 88-01) and the Browns Ferry, Unit 2 restart item identified as Intergranular Stress Corrosion Cracking (IGSCC). Enclosure 1 is the list of individuals that attended the meeting. Enclosure 2 provides a copy of the TVA summary slides used at this meeting.

The following issues were highlighted during the meeting:

- ° TVA's response to Generic Letter 88-01 will include additional welds as suggested by the OSP staff.
- ° The staff indicated that TVA's response per GL 88-01 should include a commitment to provide a Technical Specification amendment request. This amendment should be submitted prior to restart.
- ° The approximately 70 welds which were not post-IHSI inspected, while correctly classified by Generic Letter guidance as Category G, should be reinspected on an expedited schedule, when and where possible.

TVA committed to factor in the above issues as part of the GL 88-01 response scheduled to be submitted to NRC by July 1988. The staff will need to review this submittal prior to completing its review of IGSCC restart item for Browns Ferry, Unit 2.

Original Signed by

Gerald E. Gears, Project Manager  
TVA Projects Division  
Office of Special Projects

Enclosures:

1. Attendance List
2. TVA Slides Used In  
Presentation

Distribution

Docket File

NRC: PDR

Local PDR

Three on Attached List

OSP:TVA/PM

GGears as

6/2/88

TVA:AD/P

SBlack

6/2/88

8806160398 880602  
PDR ADDCK 05000260  
P PDR

ENCLOSURE 1

MEETING ON MAY 11, 1988  
IGSCC

<u>Name</u>	<u>Organization</u>
G. Gears	OSP/TVA
R. E. Shewmaker	OSP/TVA
Ed Harting	TVA
Patrick Carrier	TVA
James East	TVA
Ernie Crane	TVA
Martha Meadira	TVA
David Smith	OSP/TVA
B. D. Liaw	OSP/TVA
R. Hermann	OSP/TVA

STRATEGY FOR RESPONDING TO GL 88-01

<u>ITEM</u>	<u>PROPOSED RESPONSE</u>
1. MITIGATION PLANS	A. GIVE MITIGATION STATUS OF EACH UNIT B. DESCRIBE MITIGATION AND REPAIR PLANS C. DESCRIBE OPTIONS BEING CONSIDERED IN AREAS WHERE DECISIONS HAVE NOT BEEN MADE: UNIT 1 REPLACEMENT UNIT 1 AND 3 SAFE ENDS PENETRATION WELDS D. COMMIT TO INFORMING NRC OF MITIGATION PLANS FOR UNITS 1 AND 3 WHEN THE DECISIONS ARE MADE
2. ISI PROGRAM PLANS	A. DESCRIBE PROCEDURAL CHANGES BEING MADE TO COMPLY WITH METHODS AND PERSONNEL REQUIREMENTS B. DESCRIBE ISI PLANS FOR UNIT 2, CYCLE 6 RFO C. COMMIT TO INFORMING THE NRC OF ISI PLANS FOR UNITS 1 AND 3 BEFORE INSPECTIONS ARE INITIATED AND INFORMING THEM OF THE RESULTS BEFORE UNIT STARTUP
3. TECH SPEC CHANGE TO SHOW CONFORMANCE TO ISI REQUIREMENTS.	PROPOSE THAT CHANGES TO PROCEDURES ARE SUFFICIENT WITHOUT TECH SPEC CHANGE
4. CONFORMANCE ON LEAK DETECTION REQUIREMENTS	DESCRIBE HOW TECH SPECS HAVE BEEN CHANGED TO MEET THESE REQUIREMENTS
5. PLANS TO NOTIFY THE NRC OF NEW FLAWS OR CHANGES TO EXISTING ONES	DESCRIBE HOW THIS WILL BE ACCOMPLISHED

NUREG-0313, R.2  
SCOPE OF IGSCC SUSCEPTIBLE PIPING

1. ALL AUSTENITIC STAINLESS STEEL PIPING  $\geq$  4" DIAMETER WHICH OPERATES AT A TEMPERATURE  $\geq$  200°F
2. ALL CREVICED AUSTENITIC STAINLESS PIPING COMPONENTS

SCOPE OF BFN SUSCEPTIBLE PIPING

RECIRCULATION - INCLUDING OUTLET SAFE ENDS  
RESIDUAL HEAT REMOVAL - TO THE FIRST ISOLATION VALVE OUTSIDE OF THE DRYWELL PENETRATION  
REACTOR WATER CLEANUP - TO THE FIRST ISOLATION VALVE OUTSIDE OF THE DRYWELL PENETRATION  
CORE SPRAY - STAINLESS STEEL SECTIONS INSIDE THE PENETRATION  
RECIRCULATION INLET SAFE ENDS  
JET PUMP INSTRUMENTATION SAFE ENDS

HEAD SPRAY, CRD RETURN, AND RECIRC DISCHARGE VALVE BYPASS EITHER HAVE BEEN REMOVED OR WILL BE BEFORE STARTUP, AND SO ARE NOT INCLUDED IN SCOPE

SUMMARY OF BROWNS FERRY UNIT 2 GL 84-11 RESPONSE

INSPECTION SUMMARY:

FALL 1984: INSPECTION OF ALL ACCESSIBLE, INSPECTABLE WELDS  
AS MANDATED BY GL 84-11

SPRING 1985: POST-IHSI INSPECTION OF 25% OF WELDS TREATED BY IHSI

JUNE 1986: INSPECTION OF RECIRCULATION INLET AND CORE SPRAY SAFE ENDS

OCTOBER 1986: INSPECTION OF ALL REACTOR WATER CLEANUP WELDS

SUMMER 1987: INSPECTION OF ALL NEW WELDS RESULTING FROM SAFE END  
REPLACEMENT AND ALL WELDS RECEIVING IHSI IN SECOND EFFORT

DISPOSITION OF FLAWED WELDS:

IHSI: WELDS KR-2-14, KR-2-36, KR-2-37, KR-2-41

OVERLAY: WELDS GR-2-15 AND DSRWC-2-5

REPLACEMENT: JP-2-1A AND JP-2-1B REPLACED WITH 316NG  
DRWC-2-4 REPLACED WITH HEAT SINK WELDED 304  
ALL RECIRCULATION INLET SAFE ENDS REPLACED WITH  
NON-CREVICED DESIGN SAFE ENDS OF 316NG  
RISERS ALSO REPLACED WITH 316NG

OTHER MITIGATIONS:

IHSI APPLIED TO 149 WELDS DECEMBER 1984-MARCH 1985

IHSI APPLIED TO REPLACED SAFE END AND RISER WELDS MAY-JUNE 1987

TOTAL OF 161 WELDS TREATED BY IHSI

BFN UNIT 2

DISPOSITION OF CRACKED WELDS

WELD GR-2-15

APPLICATION OF FULL STRUCTURAL OVERLAY 0.35" THICK  
DESIGNED TO REQUIREMENTS OF GL 84-11  
FRACTURE MECHANICS FLAW EVALUATION INDICATES DESIGN BASIS  
SAFETY MARGIN MAINTAINED FOR 2 CYCLES OF OPERATION

WELD DSRWC-2-5

APPLICATION OF FULL STRUCTURAL OVERLAY 0.20" THICK  
DESIGNED TO REQUIREMENTS OF NUREG-0313, R.2, DRAFT  
FRACTURE MECHANICS FLAW EVALUATION INDICATES DESIGN BASIS  
SAFETY MARGIN MAINTAINED FOR MULTIPLE CYCLES OF OPERATION

WELDS KR-2-14, KR-2-36, KR-2-41, KR-2-37

WELDS TREATED BY IHSI  
SHORT AND SHALLOW INDICATIONS  
     $\leq$  26% THROUGHWALL DEPTH  
     $\leq$  10% CIRCUMFERENTIAL LENGTH  
FRACTURE MECHANICS FLAW EVALUATION PERFORMED IN ACCORDANCE  
WITH IWB-3640 AND GL 84-11  
EVALUATION INDICATED DESIGN BASIS SAFETY MARGIN MAINTAINED  
BY A LARGE MARGIN INDEFINITELY DUE TO EFFECTS OF IHSI

BFN UNIT 2

MITIGATION STATUS

<u>DESCRIPTION</u>	<u>NUMBER</u>	<u>CATEGORY</u>
<b>PIPING WELDS</b>		
RESISTANT WELDS.....	26	A
WELDS WITH SI AFTER 2 YEARS OF OPERATION.....	55	C
INSPECTED, NONRESISTANT WELDS.....	8	D
CRACKED WELDS WITH IHSI OR OVERLAY.....	6	E
UNINSPECTED, NONRESISTANT WELDS*.....	73*	G
TOTAL.....	168	

*Change 2 to 14 during meeting*

\*INCLUDES 70 WELDS THAT WERE NOT INSPECTED FOLLOWING IHSI

**RECIRCULATION INLET SAFE ENDS**

RESISTANT COMPONENTS.....	10	A
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**JET PUMP INSTRUMENTATION SAFE ENDS**

RESISTANT COMPONENTS.....	2	A
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MITIGATION/REPAIR PLANS

1. INSTALLATION OF HYDROGEN WATER CHEMISTRY
2. APPLICATION OF CRC, LEAK DETECTION OR REMOVAL OF PENETRATION WELDS  
(INCLUDES 3 CATEGORY G WELDS AND 2 CATEGORY D WELDS)



BFN UNIT 3

MITIGATION STATUS

<u>DESCRIPTION</u>	<u>NUMBER</u>	<u>CATEGORY</u>
PIPING WELDS		
WELDS WITH SI AFTER 2 YEARS OF OPERATION.....	42	C
INSPECTED, NONRESISTANT WELDS.....	11	D
NONINSPECTED, NONRESISTANT WELDS*.....	120	G
TOTAL.....	173	

\*INCLUDES 106 WELDS THAT WERE NOT INSPECTED FOLLOWING IHSI

RECIRCULATION INLET SAFE ENDS

CRACKED, UNMITIGATED COMPONENTS.....	4	F
UNINSPECTED, NONRESISTANT COMPONENTS.....	6	G

JET PUMP INSTRUMENTATION SAFE ENDS

CRACKED COMPONENTS OVERLAYS.....	2	E
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MITIGATION/REPAIR PLANS

1. INSTALLATION OF HYDROGEN WATER CHEMISTRY
2. IHSI OF 3 CATEGORY D WELDS AND 11 CATEGORY G WELDS
3. APPLICATION OF CRC, LEAK DETECTION, OR REMOVAL OF PENETRATION WELDS  
(INCLUDES 3 CATEGORY G WELDS AND 2 CATEGORY D WELDS)
4. RESOLUTION OF RECIRC INLET SAFE END CRACKING



BFN UNIT 1

MITIGATION STATUS

<u>DESCRIPTION</u>	<u>NUMBER</u>	<u>CATEGORY</u>
PIPING WELDS		
CRACKED WELDS WITH OVERLAY.....	42.....	E OR F
CRACKED WELDS WITH NO MITIGATION.....	4.....	F
INSPECTED, NONRESISTANT WELDS.....	118.....	D
UNINSPECTED, NONRESISTANT WELDS.....	19.....	G
TOTAL.....	183	

RECIRCULATION INLET SAFE ENDS

CRACKED, UNMITIGATED COMPONENTS.....	5.....	F
UNINSPECTED, NONRESISTANT COMPONENTS.....	5.....	G

JET PUMP INSTRUMENTATION SAFE ENDS

UNINSPECTED, NONRESISTANT COMPONENTS.....	2.....	G
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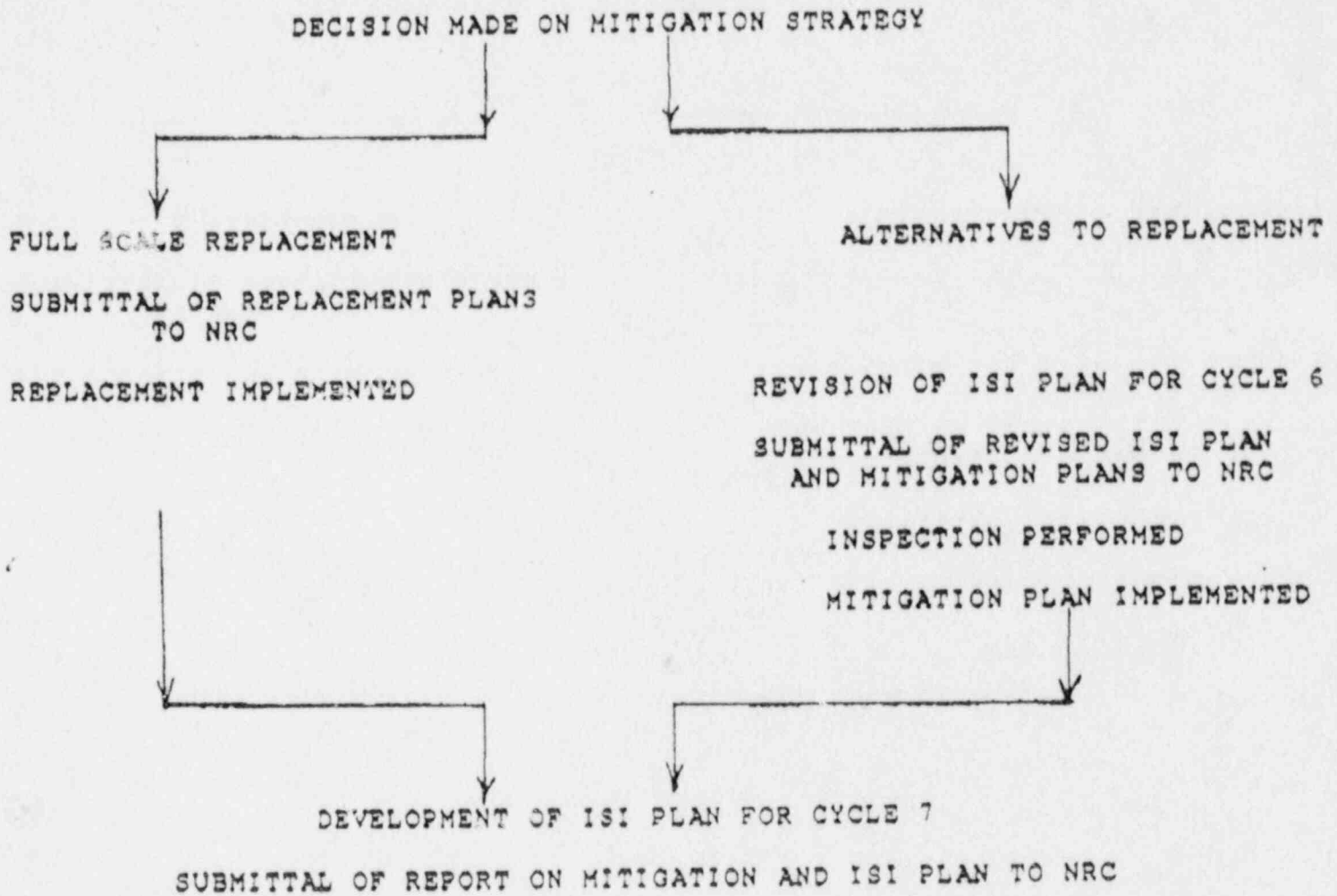
MITIGATION/REPAIR PLANS

OPTIONS BEING CONSIDERED:

1. FULL REPLACEMENT OF PIPING, SAFE ENDS, AND PENETRATIONS
2. A. STRESS IMPROVEMENT OF ALL NON-OVERLAID WELDS  
B. UPGRADING OF OVERLAYS TO MEET NUREG REQUIREMENTS  
C. APPLICATION OF CRC, LEAK DETECTION, OR REMOVAL OF PENETRATION WELDS  
(INCLUDES 4 CATEGORY D WELDS)  
D. RESOLUTION OF SAFE END CRACKING

HYDROGEN WATER CHEMISTRY HAS BEEN COMMITTED TO FOR EITHER OPTION

PLANNED FLOW OF IGSCC REPORTING FOR UNIT 1



COMPLIANCE WITH NUREG-0313, R. 2.  
FOR ISI METHODS AND PERSONNEL

*Guidelines (changed during meeting)*

THE NUREG REQUIRES THAT:

"ALL LEVEL 2 AND 3 NDE EXAMINERS OR OPERATORS FOR FLAW DETECTION AND SIZING SHOULD DEMONSTRATED THEIR FIELD PERFORMANCE CAPABILITY...THE PROGRAM BEING CONDUCTED AT EPRI NDE CENTER...IS CONSIDERED TO BE ACCEPTABLE."

THE FOLLOWING PROCEDURES ARE BEING CHANGED TO REFLECT REQUIREMENTS OF NUREG-0313, R. 2. :

- N-UT-25 "UT EXAMINATION OF PIPING WELDS FOR THE DETECTION OF LOW LEVEL CRACKLIKE REFLECTORS ORIGINATING AT THE ID SURFACE"
- N-UT-42 "UT EXAMINATION USING THE INTRASPECT 98 SYSTEM FOR THE DETECTION OF INTERGRANULAR STRESS CORROSION CRACKING IN PIPING WELDMENTS"
- N-UT-28 "UT EXAMINATION OF BACKLAY WELD REPAIRS"
- BF-UT-29 "UT EXAMINATION OF BACKLAY WELD REPAIRED PIPING WELDS"

THE SIZING PROCEDURES, WHICH ARE CURRENTLY UNDER DEVELOPMENT, WILL ALSO INCLUDE THE NEW QUALIFICATION CRITERIA.

PROPOSAL TO OMIT CHANGE OF TECHNICAL SPECIFICATIONS AS REQUESTED IN  
GL 88-01 , P. 3, PARAGRAPH 3

NRC REQUEST: "TO INCLUDE A STATEMENT IN THE SECTION ON ISI THAT THE  
INSERVICE INSPECTION PROGRAM FOR PIPING COVERED BY THE  
SCOPE OF THIS LETTER WILL BE IN CONFORMANCE WITH THE STAFF  
POSITIONS ON SCHEDULE, METHODS AND PERSONNEL, AND SAMPLE  
EXPANSION INCLUDED IN THIS LETTER...."

TVA PROPOSES TO CHANGE ISI PROCEDURES TO REQUIRE CONFORMANCE TO THE  
POSITIONS STATED IN THE GENERIC LETTER FOR THE FOLLOWING REASONS:

1. CHANGING THE ISI PROCEDURES WILL MEET THE INTENT OF THE REQUESTED  
TECH SPEC CHANGE.
2. SITE ADMINISTRATIVE PROCEDURES PROTECT PLANT PROCEDURES WHICH SATISFY  
COMMITMENTS FROM ARBITRARY CHANGES; THEREFORE, AS PART OF THE ISI  
PROCEDURES, THE REQUIREMENT FOR CONFORMANCE TO THE GL 88-01  
POSITION WOULD BE PROTECTED UNTIL IT IS SUPERSEDED BY NEW NRC  
POSITIONS.
3. INSPECTION RESULTS WILL BE REPORTED BEFORE EACH PLANT START UP,  
KEEPING THE NRC INFORMED OF BROWNS FERRY'S INSPECTION ACTIVITIES.

CHANGE OF TECHNICAL SPECIFICATIONS TO ADDRESS LEAKAGE MONITORING

AMENDMENTS TO THE LICENSES OF BFN UNITS 1, 2, AND 3 TO BRING THE LEAKAGE MONITORING PRACTICES IN LINE WITH THE NRC POSITIONS STATED IN GENERIC LETTER 84-11 WERE PROPOSED BY LETTER FROM J. A. DOMER, TVA, TO D. R. MULLER, NRC, DECEMBER 15, 1986

THESE AMENDMENTS WERE ACCEPTED AND ISSUED AS STATED IN JOHN A. ZWOLINSKI'S LETTER OF AUGUST 26, 1987

THIS REQUIREMENT IS THEREFORE SATISFIED

PLANS TO NOTIFY NRC OF NEW FLAWS, CHANGES TO EXISTING FLAWS,  
FLAW EVALUATIONS, AND REPAIR PLANS

1. SUPPLEMENTS TO TVA'S RESPONSE TO GL 88-01 WILL BE SUBMITTED TO INFORM THE NRC OF THE ISI PLAN AND IGSCC MITIGATION PLANS FOR THE NEXT REFUELING OUTAGE OF BROWNS FERRY UNITS 1 AND 3 BEFORE WORK RESUMES ON THOSE UNITS.
2. SUMMARIES OF THE INSPECTION RESULTS, FLAW EVALUATIONS, AND REPAIR OR MITIGATION IMPLEMENTATION WILL BE SUBMITTED FOR EACH UNIT BEFORE UNIT STARTUP.

Browns Ferry Nuclear Plant  
Units 1, 2, and 3

cc:

General Counsel  
Tennessee Valley Authority  
400 West Summit Hill Drive  
E11 B33  
Knoxville, Tennessee 37902

Mr. R. L. Gridley  
Tennessee Valley Authority  
5N 157B Lookout Place  
Chattanooga, Tennessee 37402-2801

Mr. H. P. Pomrehn  
Tennessee Valley Authority  
Browns Ferry Nuclear Plant  
P.O. Box 2000  
Decatur, Alabama 35602

Mr. M. J. May  
Tennessee Valley Authority  
Browns Ferry Nuclear Plant  
P.O. Box 2000  
Decatur, Alabama 35602

Mr. D. L. Williams  
Tennessee Valley Authority  
400 West Summit Hill Drive  
W10 B85  
Knoxville, Tennessee 37902

Chairman, Limestone County Commission  
P.O. Box 188  
Athens, Alabama 35611

Claude Earl Fox, M.D.  
State Health Officer  
State Department of Public Health  
State Office Building  
Montgomery, Alabama 36130

Regional Administrator, Region II  
U.S. Nuclear Regulatory Commission  
101 Marietta Street, N.W.  
Atlanta, Georgia 30323

Resident Inspector/Browns Ferry NP  
U.S. Nuclear Regulatory Commission  
Route 12, Box 637  
Athens, Alabama 35611

Mr. Richard King  
c/o U.S. GAO  
1111 North Shore Drive  
Suite 225, Box 194  
Knoxville, Tennessee 37919

Dr. Henry Myers, Science Advisor  
Committee on Interior  
and Insular Affairs  
U.S. House of Representatives  
Washington, D.C. 20515

Mr. S. A. White  
Manager of Nuclear Power  
Tennessee Valley Authority  
6N 38A Lookout Place  
1101 Market Street  
Chattanooga, Tennessee 37402-2801



DISTRIBUTION FOR MEETING SUMMARY DATED: June 2, 1988

Facility: Browns Ferry Nuclear Plant, Units 1, 2 and 3\*

Docket File

NRC PDR

Local PDR

Projects Reading

S. Ebnetter

J. Partlow

J. Axelrad

S. Richardson

S. Black

B. D. Liaw

G. Gears

M. Simms

OGC

J. Rutberg

F. Miraglia

E. Jordan

B. Grimes

D. Moran

J. Kelly

R. Shewmaker

D. Smith

R. Hermann

ACRS (10)

Hon. M. Lloyd

Hon. J. Cooper

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Hon. A. Gore

Dr. Henry Myers

Mr. R. King, GAO

P. Gwynn

J. Scarborough

G. Marcus

C. Miller

T. Elsasser

C. Ader

TVA-Rockville

Plant-specific file

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