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BALTIMORE GAS AND ELECTRIC COMPANY

P. O. BOX 1475
BALTIMORE, MARYLAND 21203

December 8, 1980

ARTHUR E. LUNDVALL, JR.
VICE PRESIDENT
SUPPLY

Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attn: Mr. Robert A. Clark, Chief
Operating Reactors Branch #3
Division of Licensing

Subject: Calvert Cliffs Nuclear Power Plant
Unit No. 2, Docket No. 50-318
Westinghouse Low Pressure Turbine Disc Inspection

- References:
- a) NRC letter dated 2/25/80 from D. G. Eisenhut to A. E. Lundvall, Jr., same subject.
 - b) BG&E letter dated 3/18/80 from A. E. Lundvall, Jr. to D. G. Eisenhut, same subject.
 - c) BG&E letter dated 3/24/80 from A. E. Lundvall, Jr. to D. G. Eisenhut, same subject.

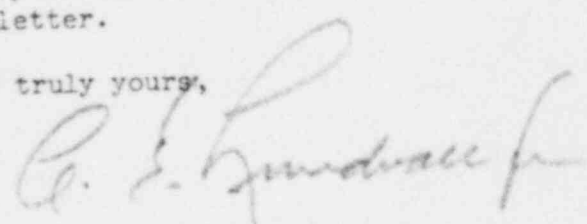
Gentlemen:

Enclosed please find a revised set of data for Calvert Cliffs Unit No. 2 Low Pressure Turbine Discs. The original data, which was submitted in response to Reference (a), was contained in References (b) and (c). The revised data is a result of additional experience gained from field inspection. It also considers thermal stresses and bending stresses not previously used in preparing disc data.

The data consists of Attachment 1 (proprietary) which supersedes Attachment 3 of Reference (b), and Attachment 2 (non-proprietary) which supersedes Attachment 4 of Reference (b).

It is requested that Attachment 1 of this letter be treated as proprietary information and withheld from public disclosure. The Application and Affidavit for withholding proprietary information found in Attachments 1 and 2 of reference (c) apply to this letter.

Very truly yours,



Attachments (2)

cc: J. A. Biddison, Esquire
G. F. Trowbridge, Esquire
Mr. E. L. Conner, Jr. - NRC

THIS DOCUMENT CONTAINS
POOR QUALITY PAGES

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C] INDICATES WESTINGHOUSE PROPRIETARY
LEVELS B,C,E

DATE OF REPORT : 092280

ID # : D080100901

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION		B. MATERIAL PROPERTIES (HUB)			C. MATERIAL PROPERTIES (RIM)		
1. BUILDING BLOCK	80	1. TYPE	(MIN. Y.S. C	TB	1. Y.S. (KSI)	C]
2. UNIT	CALVERT CLIFFS #2	2. SUPPLIER	MIDVALE	HEPPENSTALL	2. U.T.S. (KSI)	C]
3. CUSTOMER	BALTIMORE G&E	3. Y.S. (KSI)	C	C	3. ELONGATION	C]
4. LPM	1	4. U.T.S. (KSI)	C	C	4. R.A.	C]
5. LOCATION	GOV	5. ELONGATION	C	C	5. FATT (DEG.F)	C]
6. DISC#	1	6. R.T. IMPACT (FT.LB.)	C	C	6. R.T. IMPACT (FT.LB.)	C]
7. TEST NO.	YNIS13	7. FATT (DEG.F)	C	C	7. U.S. IMPACT TEMP. (DEG.F)	C]
		8. R.T. IMPACT (FT.LB.)	C	C	8. U.S. IMPACT ENG. (FT.LB.)	C]
		9. U.S. IMPACT TEMP. (DEG.F)	C	C	9. U.S. KIC (KSI*SQRT(IN.))	C]
		10. U.S. IMPACT ENG. (FT.LB.)	C	C			
		11. U.S. KIC (KSI*SQRT(IN.))	C	C			

D. CHEMISTRY

C	MN	]	SI	]	P	]	CR	]	MO	]	V]
C	NI	]	AS	]	SB	]	SN	]	AL	]	CU]
C]]]]]]

E. BORE STRESS

SPEED (RPM)	STRESS
1. 1800	(KSI) []
2. 2160 (120%)	(KSI) []

F. CRACK DATA (KEYWAY RADIUS (IN) [])

1. A-CR-OP (1800 RPM) (IN.) []
2. A-CR-OS (OVERSPEED) (IN.) []

G. SERVICE DATA

1. OPER. TEMP. METAL TEMP. HUB (DEG.F)	[]
2. ESTIMATED MAX DA/DT (IN/HR)	[]
3. ESTIMATED MAX DA/DT (IN/MONTH)	[]
4. Crack Length Projected Til Inspection (in)	[]
5. Critical Crack Ratio (A ÷ Acr(os))	[]

H. INSPECTION STATUS

1. OPERATING TIME AT INSPECTION (HR.)	[]
2. KEYWAY CRACK DEPTH (MAX.)-(IN.)	[]
3. BORE CRACK DEPTH (MAX.)-(IN.)	[]
4. DISK STATUS	[]

C] INDICATES WESTINGHOUSE PROPRIETARY LEVELS B,C,E

DATE OF REPORT : 092280

ID # : 0080100901

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION

1. BUILDING BLOCK 80

2. UNIT CALVERT CLIFFS #2

3. CUSTOMER: BALTIMORE G&E

4. LPM 1

5. LOCATION GOV

6. DISC# 2

7. TEST NO. TN1868

B. MATERIAL PROPERTIES (HUB)

1. TYPE (MIN. Y.S. C) (KSI) TB

2. SUPPLIER: BETHLEHEM STEEL

3. Y.S. (KSI)

4. U.T.S. (KSI)

5. ELONGATION

6. R.A.

7. FATT (DEG.F)

8. R.T. IMPACT (FT.LB.)

9. U.S. IMPACT TEMP. (DEG.F)

10. U.S. IMPACT ENG. (FT.LB.)

11. U.S. KIC (KSI*SQRT(IN.))

C. MATERIAL PROPERTIES (RIM)

1. Y.S. (KSI)

2. U.T.S. (KSI)

3. ELONGATION

4. R.A.

5. FATT (DEG.F)

6. R.T. IMPACT (FT.LB.)

7. U.S. IMPACT TEMP. (DEG.F)

8. U.S. IMPACT ENG. (FT.LB.)

9. U.S. KIC (KSI*SQRT(IN.))

D. CHEMISTRY

C M N SI P CR MO V

W S B SN AL CU S

E. BORE STRESS

SPEED (RPM) STRESS

1. 1800 (KSI) C

2. 2160 (120%) (KSI) C

F. CRACK DATA (KEYWAY RADIUS (IN) C

1. A-CR-0P (1800 RPH) (IN.) E

2. A-CR-0S (OVERSPEED) (IN.) E

G. SERVICE DATA

1. OPER. TEMP. METAL TEMP. HUB (DEG.F) C

2. ESTIMATED MAX DA/DT (IN/HR) C

3. ESTIMATED MAX DA/DT (IN/MONTH) C

4. Crack Length Projected Til Inspection (in) [

5. Critical Crack Ratio (A ÷ Acr(0s)) [

H. INSPECTION STATUS

1. OPERATING TIME AT INSPECTION (HR.) C

2. KEYWAY CRACK DEPTH (MAX.)-(IN.) C

3. BORE CRACK DEPTH (MAX.)-(IN.) C

4. DISK STATUS C

C] INDICATES WESTINGHOUSE PROPRIETARY
LEVELS B,C,E

DATE OF REPORT 1 092280

ID # : D080100901

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION

1. BUILDING BLOCK 80
2. UNIT CALVERT CLIFFS #2
3. CUSTOMER: BALTIMORE G&E
4. LPM 1
5. LOCATION GOV
6. DISC# 3
7. TEST NO. TNIS15

B. MATERIAL PROPERTIES (HUB)

1. TYPE (MIN. Y.S. [(KSI)]) TB
2. SUPPLIER BETHLEHEM STEEL
3. Y.S. (KSI)
4. U.T.S. (KSI)
5. ELONGATION
6. R.A.
7. FATT (DEG. F)
8. R.T. IMPACT (FT.LB.)
9. U.S. IMPACT TEMP. (DEG. F)
10. U.S. IMPACT ENG. (FT.LB.)
11. U.S. KIC (KSI*SQRT(IN.))

C. MATERIAL PROPERTIES (RIM)

1. Y.S. (KSI)
2. U.T.S. (KSI)
3. ELONGATION
4. R.A.
5. FATT (DEG. F)
6. R.T. IMPACT (FT.LB.)
7. U.S. IMPACT TEMP. (DEG. F)
8. U.S. IMPACT ENG. (FT.LB.)
9. U.S. KIC (KSI*SQRT(IN.))

D. CHEMISTRY

C] MN] SI] P] CR] MO] V]
C] NI] AS] SB] SH] AL] CU] S]

E. BORE STRESS

SPEED (RPM) STRESS

1. 1800 (KSI)]
2. 2160 (120%) (KSI)]

F. CRACK DATA (KEYWAY RADIUS (IN)])

1. A-CR-OP (1800 RPM) (IN.)]
2. A-CR-OS (OVERSPEED) (IN.)]

G. SERVICE DATA

1. OPER. TEMP. METAL TEMP. HUB (DEG. F)]
2. ESTIMATED MAX DA/DT (IN/HR)]
3. ESTIMATED MAX DA/DT (IN/MONTH)]
4. Crack Length Projected Til Inspection (in)]
5. Critical Crack Ratio (A + Acr(os))]

H. INSPECTION STATUS

1. OPERATING TIME AT INSPECTION (HR.)]
2. KEYWAY CRACK DEPTH (MAX.)-(IN.)]
3. BORE CRACK DEPTH (MAX.)-(IN.)]
4. DISK STATUS]

E] INDICATES WESTINGHOUSE PROPRIETARY LEVELS B,C,E

DATE OF REPORT : 092280

ID # : D080100901

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION

1. BUILDING BLOCK 80
 2. UNIT
 3. CUSTOMER: CALVERT CLIFFS #2 BALTIMORE
 4. LPP
 5. LOCATION 1 GOV
 6. DISC# 4
 7. TEST NO. TN1579

B. MATERIAL PROPERTIES (HUB)

1. TYPE (MIN. Y.S. [] (KSI)) TB
 2. SUPPLIER: MIDVALE HEPPENSTALL
 3. Y.S. (KSI)
 4. U.T.S. (KSI)
 5. ELONGATION
 6. R.A.
 7. FATT (DEG.F)
 8. R.T. IMPACT (FT.LB.)
 9. U.S. IMPACT TEMP. (DEG.F)
 10. U.S. IMPACT ENG. (FT.LB.)
 11. U.S. KIC [KSI*SQRT(IN.)]

C. MATERIAL PROPERTIES (RIM)

1. Y.S. (KSI)
 2. U.T.S. (KSI)
 3. ELONGATION
 4. R.A.
 5. FATT (DEG.F)
 6. R.T. IMPACT (FT.LB.)
 7. U.S. IMPACT TEMP. (DEG.F)
 8. U.S. IMPACT ENG. (FT.LB.)
 9. U.S. KIC [KSI*SQRT(IN.)]

D. CHEMISTRY

C MN SI P CR MO V
 NI AS SB SN AL CU S

E. BORE STRESS

SPEED (RPM) STRESS
 1. 1800 (KSI) []
 2. 2160 (120%) (KSI) []

F. CRACK DATA (KEYWAY RADIUS (IN) [])

1. A-CR-OP (1800 RPM) (IN.) []
 2. A-CR-OS (OVERSPEED) (IN.) []

G. SERVICE DATA

1. OPER. TEMP. METAL TEMP. HUB (DEG.F) []
 2. ESTIMATED MAX DA/DT (IN/HR) []
 3. ESTIMATED MAX DA/DT (IN/MONTH) []
 4. Crack Length Projected Til Inspection (in) []
 5. Critical Crack Ratio (A ÷ Acr(0a)) []

H. INSPECTION STATUS

1. OPERATING TIME AT INSPECTION (HR.) []
 2. KEYWAY CRACK DEPTH (MAX.)-(IN.) []
 3. BORE CRACK DEPTH (MAX.)-(IN.) []
 4. DISK STATUS []

C] INDICATES WESTINGHOUSE PROPRIETARY LEVELS B,C,E

DATE OF REPORT : 092280

ID # : D080100901

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION

1. BUILDING BLOCK 80
 2. UNIT CALVERT CLIFFS #2
 3. CUSTOMER BALTIMORE G&E
 4. LP# 1
 5. LOCATION GOV
 6. DISC# 5
 7. TEST NO. TN1511

B. MATERIAL PROPERTIES (HUB)

1. TYPE (MIN. Y.S. [](KSI)) TB]
 2. SUPPLIER MIDVALE HEPPENSTALL]
 3. Y.S. [KSI]]
 4. U.T.S. [KSI]]
 5. ELONGATION]
 6. R.A.]
 7. FATT (DEG.F)]
 8. R.T. IMPACT (FT.LB.)]
 9. U.S. IMPACT TEMP. (DEG.F)]
 10. U.S. IMPACT ENG. (FT.LB.)]
 11. U.S. KIC [KSI*SQRT(IN.)]]

C. MATERIAL PROPERTIES (RIM)

1. Y.S. [KSI]]
 2. U.T.S. [KSI]]
 3. ELONGATION]
 4. R.A.]
 5. FATT (DEG.F)]
 6. R.T. IMPACT (FT.LB.)]
 7. U.S. IMPACT TEMP. (DEG.F)]
 8. U.S. IMPACT ENG. (FT.LB.)]
 9. U.S. KIC [KSI*SQRT(IN.)]]

D. CHEMISTRY

C] MN]] SI]] P]] CR]] MO]] V]]
 C] NI]] AS]] SB]] SH]] AL]] CU]] S]]

E. BORE STRESS

SPEED (RPM) STRESS
 1: 1800 [KSI]]
 2: 2100 (120%) [KSI]]

F. CRACK DATA (KEYWAY RADIUS (IN)]

1: A-CR-05 (OVERSPEED) (IN.)]

G. SERVICE DATA

1. OPER. TEMP. METAL TEMP. HUB (DEG.F)]
 2. ESTIMATED MAX DA/DT (IN/HR)]
 3. ESTIMATED MAX DA/DT (IN/MONTH)]
 4. Crack Length Projected Til Inspection (in)]
 5. Critical Crack Ratio (A → Acr(0s))]

H. INSPECTION STATUS

1. OPERATING TIME AT INSPECTION (HR.)]
 2. KEYWAY CRACK DEPTH (MAX.)-(IN.)]
 3. BORE CRACK DEPTH (MAX.)-(IN.)]
 4. DISK STATUS]

C] INDICATES WESTINGHOUSE PROPRIETARY LEVELS B,C,E

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ID # : 0080100901

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION		B. MATERIAL PROPERTIES (HUB)			C. MATERIAL PROPERTIES (RIM)		
1. BUILDING BLOCK	80	1. TYPE	(MIN. Y.S. [])	TC	1. Y.S. (KSI)	[]	[]
2. UNIT	CALVERT CLIFFS #2	2. SUPPLIER	BETHLEHEM	STEEL	2. U.T.S. (KSI)	[]	[]
3. CUSTOMER	BALTIMORE	3. Y.S. (KSI)	[]	[]	3. ELONGATION	[]	[]
4. LP#	1	4. U.T.S. (KSI)	[]	[]	4. R.A.	[]	[]
5. LOCATION	GOV	5. ELONGATION	[]	[]	5. FATT (DEG.F)	[]	[]
6. DISC#	6	6. R.A.	[]	[]	6. R.T. IMPACT (FT.LB.)	[]	[]
7. TEST NO.	TN1903	7. FATT (DEG.F)	[]	[]	7. U.S. IMPACT TEMP. (DEG.F)	[]	[]
		8. R.T. IMPACT (FT.LB.)	[]	[]	8. U.S. IMPACT ENG. (FT.LB.)	[]	[]
		9. U.S. IMPACT TEMP. (DEG.F)	[]	[]	9. U.S. KIC (KSI*SQRT(IN.))	[]	[]
		10. U.S. IMPACT ENG. (FT.LB.)	[]	[]			
		11. U.S. KIC (KSI*SQRT(IN.))	[]	[]			

D. CHEMISTRY							
C	MN	SI	P	CR	MO	V	
NI	AS	SB	SN	AL	CU	S	

E. BORE STRESS		F. CRACK DATA (KEYWAY RADIUS (IN))	
SPEED (RPM)	STRESS		
1. 1800	(KSI) []	1. A-CR-OP (1800 RPM) (IN.)	[]
2. 2160 (120%)	(KSI) []	2. A-CR-OS (OVERSPEED) (IN.)	[]

G. SERVICE DATA	
1. OPER. TEMP. METAL TEMP. HUB (DEG.F)	[]
2. ESTIMATED MAX DA/DT (IN/HR)	[]
3. ESTIMATED MAX DA/DT (IN/MONTH)	[]
4. Crack Length Projected Til Inspection (in)	[]
5. Critical Crack Ratio (A ÷ Acr(os))	[]

H. INSPECTION STATUS	
1. OPERATING TIME AT INSPECTION (HR.)	[]
2. KEYWAY CRACK DEPTH (MAX.)-(IN.)	[]
3. BORE CRACK DEPTH (MAX.)-(IN.)	[]
4. DISK STATUS	[]

[] INDICATES WESTINGHOUSE PROPRIETARY
LEVELS B,C,E

DATE OF REPORT : 092280

ID # : D080100902

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION			B. MATERIAL PROPERTIES (HUB)			C. MATERIAL PROPERTIES (RIM)		
1. BUILDING BLOCK	80		1. TYPE (MIN. Y.S. C	TB (KSI))		1. Y.S. (KSI)	C	J
2. UNIT	CALVERT CLIFFS #2		2. SUPPLIER:	MIDVALE HEPPESTALL	J	2. U.T.S. (KSI)	C	J
3. CUSTOMER:	BALTIMORE G&E		3. Y.S. (KSI)		J	3. ELONGATION	C	J
4. LPH	I		4. U.T.S. (KSI)		J	4. R.A.	C	J
5. LCGATION	GEN		5. ELONGATION		J	5. FATT (DEG.F)	C	J
6. DISC#	I		6. R.A.		J	6. R.T. IMPACT (FT.LB.)	C	J
7. TEST NO.	YN1507		7. FATT (DEG.F)		J	7. U.S. IMPACT TEMP.	C	J
			8. R.T. IMPACT (FT.LB.)		J	8. U.S. IMPACT ENG. (DEG.F)	C	J
			9. U.S. IMPACT TEMP.		J	9. U.S. IMPACT ENG. (FT.LB.)	C	J
			10. U.S. IMPACT ENG. (FT.LB.)		J	9. U.S. KIC (KSI*SQRT(IN.))	C	J
			11. U.S. KIC (KSI*SQRT(IN.))		J			
D. CHEMISTRY								
	C	MH	SI	P	CR	MO	V	
	NI	AS	SB	SH	AL	CU	S	
E. BORE STRESS			F. CRACK DATA (KEYWAY RADIUS (IN) [])					
	SPEED (RPM)	STRESS						
1.	1800	(KSI) []				1. A-CR-OP (1800 RPM) (IN.) []		
2.	2160 (120%)	(KSI) []				2. A-CR-OS (OVERSPEED) (IN.) []		
G. SERVICE DATA								
1.	OPER. TEMP. METAL TEMP. HUB (DEG.F)	[]						
2.	ESTIMATED MAX DA/DT (IN/HR)	[]						
3.	ESTIMATED MAX DA/DT (IN/MONTH)	[]						
4.	Crack Length Projected Til Inspection (in)	[]						
5.	Critical Crack Ratio (A ÷ Acr(0s))	[]						
H. INSPECTION STATUS								
1.	OPERATING TIME AT INSPECTION (HR.)	[]						
2.	KEYWAY CRACK DEPTH (MAX.)-(IN.)	[]						
3.	BORE CRACK DEPTH (MAX.)-(IN.)	[]						
4.	DISK STATUS	C						

[] INDICATES WESTINGHOUSE PROPRIETARY LEVELS B,C,E

DATE OF REPORT : 092280

ID # : D080100902

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION		B. MATERIAL PROPERTIES (HUB)			C. MATERIAL PROPERTIES (RIM)		
1. BUILDING BLOCK	80	1. TYPE	MIN. Y.S. (KSI)	Y	1. Y.S. (KSI)	Y	Y
2. UNIT	CALVERT CLIFFS #2	2. SUPPLIER	MIDVALE HEPPENSTALL	Y	2. U.T.S. (KSI)	Y	Y
3. CUSTOMER	BALTIMORE G&E	3. Y.S. (KSI)		Y	3. ELONGATION	Y	Y
4. LP#	1	4. U.T.S. (KSI)		Y	4. R.A.	Y	Y
5. LOCATION	1 GEN	5. ELONGATION		Y	5. FATT (DEG.F)	Y	Y
6. DISC#	2	6. R.A.		Y	6. R.T. IMPACT (FT.LB.)	Y	Y
7. TEST NO.	TN1508	7. FATT (DEG.F)		Y	7. U.S. IMPACT TEMP. (DEG.F)	Y	Y
		8. R.T. IMPACT (FT.LB.)		Y	8. U.S. IMPACT ENG. (FT.LB.)	Y	Y
		9. U.S. IMPACT TEMP. (DEG.F)		Y	9. U.S. KIC (KSI*SQRT(IN.))	Y	Y
		10. U.S. IMPACT ENG. (FT.LB.)		Y			
		11. U.S. KIC (KSI*SQRT(IN.))		Y			

D. CHEMISTRY							
C	MN	SI	P	CR	MO	V	
NI	AS	SB	SN	AL	CU	S	

E. BORE STRESS		F. CRACK DATA (KEYWAY RADIUS (IN.))	
SPEED (RPM)	STRESS (KSI)	1. A-CR-OP (1800 RPM) (IN.)	2. A-CR-OS (OVERSPEED) (IN.)
1. 1800	[]	[]	[]
2. 2160 (120%)	[]	[]	[]

G. SERVICE DATA			
1. OPER. TEMP. METAL TEMP. HUB (DEG.F)	[]	[]	[]
2. ESTIMATED MAX DA/DT (IN/HR)	[]	[]	[]
3. ESTIMATED MAX DA/DT (IN/MONTH)	[]	[]	[]
4. Crack Length Projected Til Inspection (in)	[]	[]	[]
5. Critical Crack Ratio (A ÷ Acr(os))	[]	[]	[]

H. INSPECTION STATUS			
1. OPERATING TIME AT INSPECTION (HR.)	[]	[]	[]
2. KEYWAY CRACK DEPTH (MAX.)-(IN.)	[]	[]	[]
3. BORE CRACK DEPTH (MAX.)-(IN.)	[]	[]	[]
4. DISK STATUS	[]	[]	[]

E 3 INDICATES WESTINGHOUSE PROPRIETARY LEVELS B,C,E

DATE OF REPORT : 092280

ID # : D080100902

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION		B. MATERIAL PROPERTIES (HUB)			C. MATERIAL PROPERTIES (RIM)		
1. BUILDING BLOCK	80	1. TYPE (MIN. Y.S. [])	3. Y.S. (KSI)	1. Y.S. (KSI)			
2. UNIT	CALVERT CLIFFS #2	2. SUPPLIER: BETHLEHEM STEEL	4. U.T.S. (KSI)	2. U.T.S. (KSI)			
3. CUSTOMER:	BALTIMORE G&E		5. ELONGATION	3. ELONGATION			
4. LPM	1		6. R.A.	4. R.A.			
5. LOCATION	GEN		7. FATT (DEG.F)	5. FATT (DEG.F)			
6. DISC#	3		8. R.T. IMPACT (FT.LB.)	6. R.T. IMPACT (FT.LB.)			
7. TEST NO.	TN1509		9. U.S. IMPACT TEMP. (DEG.F)	7. U.S. IMPACT TEMP. (DEG.F)			
			10. U.S. IMPACT ENG. (FT.LB.)	8. U.S. IMPACT ENG. (FT.LB.)			
			11. U.S. KIC (KSI*SQRT(IN.))	9. U.S. KIC (KSI*SQRT(IN.))			

D. CHEMISTRY							
C	MN	SI	P	CR	MO	Y	
Ni	AS	SB	SN	AL	CU	S	

E. BORE STRESS		F. CRACK DATA (KEYWAY RADIUS (IN) [])	
SPEED (RPM)	STRESS		
1. 1800	[KSI] []	1. A-CR-0P (1800 RPM) (IN.)	[]
2. 2160 (120%)	[KSI] []	2. A-CR-0S (OVERSPEED) (IN.)	[]

G. SERVICE DATA	
1. OPER. TEMP. METAL TEMP. HUB (DEG.F)	[]
2. ESTIMATED MAX DA/DT (N/HR)	[]
3. ESTIMATED MAX DA/DT (N/MONTH)	[]
4. Crack Length Projected Til Inspection (in)	[]
5. Critical Crack Ratio (A ÷ Acr(0s))	[]

H. INSPECTION STATUS	
1. OPERATING TIME AT INSPECTION (HR.)	[]
2. KEYWAY CRACK DEPTH (MAX.)-(IN.)	[]
3. BORE CRACK DEPTH (MAX.)-(IN.)	[]
4. DISK STATUS	[]

C] INDICATES WESTINGHOUSE PROPRIETARY LEVELS B,C,E

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LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION		B. MATERIAL PROPERTIES (HUB)			C. MATERIAL PROPERTIES (RIM)		
1. BUILDING BLOCK	80	1. TYPE (MIN. Y.S. C	]	TB	1. Y.S. (KSI)	C]
2. UNIT	CALVERT CLIFFS #2	2. SUPPLIER: MIDVALE HEPPENSTALL	]	(KSI)]	2. U.T.S. (KSI)	C]
3. CUSTOMER:	BALTIMORE G&E	3. Y.S. (KSI)	]		3. ELONGATION	C]
4. LP#	1	4. U.T.S. (KSI)	]		4. R.A.	C]
5. LOCATION	GEN	5. ELONGATION	]		5. FATT (DEG.F)	C]
6. DISC#	4	6. R.A.	]		6. R.T. IMPACT (FT.LB.)	C]
7. TEST NO.	TN1S10	7. FATT (DEG.F)	]		7. U.S. IMPACT TEMP. (DEG.F)	C]
		8. R.T. IMPACT (FT.LB.)	]		8. U.S. IMPACT ENG. (FT.LB.)	C]
		9. U.S. IMPACT TEMP. (DEG.F)	]		9. U.S. KIC (KSI*SQRT(IN.))	C]
		10. U.S. IMPACT ENG. (FT.LB.)]				
		11. U.S. KIC (KSI*SQRT(IN.))]				

D. CHEMISTRY							
C	MN	]	SI	]	P	]	CR
]]]]]]]]
NI	AS	]	SB	]	SH	]	AL
]]]]]]]]
							MO
							Y
							S
							CU

E. BORE STRESS		F. CRACK DATA (KEYWAY RADIUS (IN.)	
SPEED (RPM)	STRESS	1:	2:
1. 1800	(KSI) []	A-CR-OP (1800 RPM) (IN.)	[]
2. 2160 (120%)	(KSI) []	A-CR-OS (OVERSPEED) (IN.)	[]

G. SERVICE DATA			
1. OPER. TEMP. METAL TEMP. HUB (DEG.F)	[]]]
2. ESTIMATED MAX DA/DT (IN/HR)	[]]]
3. ESTIMATED MAX DA/DT (IN/MONTH)	[]]]
4. Crack Length Projected Til Inspection (in)	[]]]
5. Critical Crack Ratio (A ÷ Acr(00))	[]]]

H. INSPECTION STATUS			
1. OPERATING TIME AT INSPECTION (HR.)	[]]]
2. KEYWAY CRACK DEPTH (MAX.)-(IN.)	[]]]
3. BORE CRACK DEPTH (MAX.)-(IN.)	[]]]
4. DISK STATUS	[]]]

E 3 INDICATES WESTINGHOUSE PROPRIETARY LEVELS B,C,E

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DATE OF REPORT : 092280

ID # : D080100902

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION		B. MATERIAL PROPERTIES (HUB)				C. MATERIAL PROPERTIES (RIM)			
1. BUILDING BLOCK	80	1. TYPE	TA						
2. UNIT	CALVERT CLIFFS #2	2. SUPPLIER	MIDVALE HEPPENSTALL						
3. CUSTOMER	BALTIMORE G&E	3. Y.S. (KSI)				1. Y.S. (KSI)			
4. LP#	1	4. U.T.S. (KSI)				2. U.T.S. (KSI)			
5. LOCATION	1 GEN	5. ELONGATION				3. ELONGATION			
6. DISC#	6	6. R.A.				4. R.A.			
7. TEST NO.	TNI900	7. FATT (DEG.F)				5. FATT (DEG.F)			
		8. R.T. IMPACT (FT.LB.)				6. R.T. IMPACT (FT.LB.)			
		9. U.S. IMPACT TEMP. (DEG.F)				7. U.S. IMPACT TEMP. (DEG.F)			
		10. U.S. IMPACT ENG. (FT.LB.)				8. U.S. IMPACT ENG. (FT.LB.)			
		11. U.S. KIC (KSI*SQRT(IN.))				9. U.S. KIC (KSI*SQRT(IN.))			
D. CHEMISTRY									
	C	MN	SI	P	CR	HQ	V		
	NI	AS	SB	SN	AL	CU	S		
E. BORE STRESS					F. CRACK DATA (KEYWAY RADIUS (IN) [])				
	SPEED (RPM)	STRESS							
1.	1800	(KSI) []			1.	A-CR-OP (1800 RPH) (IN.) []			
2.	2160 (120%)	(KSI) []			2.	A-CR-OS (OVERSPEED) (IN.) []			
G. SERVICE DATA									
1.	OPER. TEMP. METAL TEMP. HUB (DEG.F)	[]							
2.	ESTIMATED MAX DA/DT (IN/HR)	[]							
3.	ESTIMATED MAX DA/DT (IN/MONTH)	[]							
4.	Crack Length Projected Til Inspection (in)	[]							
5.	Critical Crack Ratio (A ÷ Acr(os))	[]							
H. INSPECTION STATUS									
1.	OPERATING TIME AT INSPECTION (HR.)	[]							
2.	KEYWAY CRACK DEPTH (MAX.)-(IN.)	[]							
3.	BORE CRACK DEPTH (MAX.)-(IN.)	[]							
4.	DISK STATUS	[]							

C] INDICATES WESTINGHOUSE PROPRIETARY LEVELS B,C,E

DATE OF REPORT : 092280

ID # : D080100903

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION

1. BUILDING BLOCK 80
 2. UNIT
 3. CUSTOMER: CALVERT CLIFFS #2 BALTIMORE GGE
 4. LP# 2
 5. LOCATION GOV
 6. DISC# 1
 7. TEST NO. TN1524

B. MATERIAL PROPERTIES (HUB)

1. TYPE (MIN. Y.S. C) (KSI) TB
 2. SUPPLIER: MIDVALE HEPPENSTALL
 3. Y.S. (KSI)
 4. U.T.S. (KSI)
 5. ELONGATION
 6. R.A.
 7. FATT (DEG.F)
 8. R.T. IMPACT (FT.LB.)
 9. U.S. IMPACT TEMP. (DEG.F)
 10. U.S. IMPACT ENG. (FT.LB.)
 11. U.S. KIC (KSI*SQRT(IN.))

C. MATERIAL PROPERTIES (RIM)

1. Y.S. (KSI)
 2. U.T.S. (KSI)
 3. ELONGATION
 4. R.A.
 5. FATT (DEG.F)
 6. R.T. IMPACT (FT.LB.)
 7. U.S. IMPACT TEMP. (DEG.F)
 8. U.S. IMPACT ENG. (FT.LB.)
 9. U.S. KIC (KSI*SQRT(IN.))

D. CHEMISTRY

C] MN] SI] P] CR] MO] V]
 NI] AS] SB] SN] AL] CU] S]

E. BORE STRESS SPEED (RPM) STRESS

1: 1800 (120%) (KSI) E]

F. CRACK DATA (KEYWAY RADIUS (IN) E])

1: A-CR-85 (OVERSPEE), (IN.) E]

G. SERVICE DATA

1. OPER. TEMP. METAL TEMP. HUB (DEG.F) C]
 2. ESTIMATED MAX DA/DT (IN/HR) C]
 3. ESTIMATED MAX DA/DT (IN/MONTH) C]
 4. Crack Length Projected Til Inspection (in) []
 5. Critical Crack Ratio (A ÷ Acr(0s)) []

H. INSPECTION STATUS

1. OPERATING TIME AT INSPECTION (HR.) C]
 2. KEYWAY CRACK DEPTH (MAX.)-(IN.) C]
 3. BORE CRACK DEPTH (MAX.)-(IN.) C]
 4. DISK STATUS E]

C] INDICATES WESTINGHOUSE PROPRIETARY LEVELS B,C,E

DATE OF REPORT : 092280

ID # : D080100903

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION			B. MATERIAL PROPERTIES (HUB)			C. MATERIAL PROPERTIES (RIM)		
1. BUILDING BLOCK	80		1. TYPE	TB		1. Y.S. (KSI)		
2. UNIT	CALVERT CLIFFS #2		2. SUPPLIER	MIDVALE HEPPENSTALL		2. U.T.S. (KSI)		
3. CUSTOMER	BALTIMORE G&E		3. Y.S. (KSI)			3. ELONGATION		
4. LPM	2		4. U.T.S. (KSI)			4. R.A.		
5. LOCATION	GOV		5. ELONGATION			5. FATT (DEG.F)		
6. DISC#	2		6. R.A.			6. R.T. IMPACT (FT.LB.)		
7. TEST NO.	TN1525		7. FATT (DEG.F)			7. U.S. IMPACT TEMP. (DEG.F)		
			8. R.T. IMPACT (FT.LB.)			8. U.S. IMPACT ENG. (FT.LB.)		
			9. U.S. IMPACT TEMP. (DEG.F)			9. U.S. KIC (KSI*SQRT(IN.))		
			10. U.S. IMPACT ENG. (FT.LB.)					
			11. U.S. KIC (KSI*SQRT(IN.))					

D. CHEMISTRY													
C		MN		SI		P		CR		MO		V	
	NI		AS		SB		SN		AL		CU		S

E. BORE STRESS			F. CRACK DATA (KEYWAY RADIUS (IN.)		
SPEED (RPM)	STRESS				
1. 1800	(KSI)		1. A-CR-OP (1800 RPM) (IN.)		
2. 2160 (120%)	(KSI)		2. A-CR-OS (OVERSPEED) (IN.)		

G. SERVICE DATA		
1. OPER. TEMP. METAL TEMP. HUB (DEG.F)		
2. ESTIMATED MAX DA/DT (IN/HR)		
3. ESTIMATED MAX DA/DT (IN/MONTH)		
4. Crack Length Projected Till Inspection (in)		
5. Critical Crack Ratio (A ÷ Acr(os))		

H. INSPECTION STATUS		
1. OPERATING TIME AT INSPECTION (HR.)		
2. KEYWAY CRACK DEPTH (MAX.)-(IN.)		
3. BORE CRACK DEPTH (MAX.)-(IN.)		
4. DISK STATUS		

C] INDICATES WESTINGHOUSE PROPRIETARY LEVELS B,C,E

DATE OF REPORT : 092280

ID # : D080100903

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION

1. BUILDING BLOCK 80

2. UNIT CALVERT CLIFFS #2

3. CUSTOMER: BALTIMORE G&E

4. LP# 2

5. LOCATION GOV

6. DISC# 4

7. TEST NO. TN1527

B. MATERIAL PROPERTIES (HUB)

1. TYPE TB

2. SUPPLIER: MIDVALE HEPPENSTALL

3. Y.S. (KSI)] (KSI)]

4. U.T.S. (KSI)]

5. ELONGATION]

6. R.A.]

7. FATT (DEG.F)]

8. R.T. IMPACT (FT.LB.)]

9. U.S. IMPACT TEMP. (DEG.F)]

10. U.S. IMPACT ENG. (FT.LB.)]

11. U.S. KIC (KSI*SQRT(IN.))]

C. MATERIAL PROPERTIES (RIM)

1. Y.S. (KSI)]

2. U.T.S. (KSI)]

3. ELONGATION]

4. R.A.]

5. FATT (DEG.F)]

6. R.T. IMPACT (FT.LB.)]

7. U.S. IMPACT TEMP. (DEG.F)]

8. U.S. IMPACT ENG. (FT.LB.)]

9. U.S. KIC (KSI*SQRT(IN.))]

D. CHEMISTRY

C] MN] SI] P] CR] MO] V]

NI] AS] SB] SH] AL] CU] S]

E. BORE STRESS

SPEED (RPM) STRESS

1. 1800 (KSI)]

2. 2160 (120%) (KSI)]

F. CRACK DATA (KEYWAY RADIUS (IN)]

1. A-CR-OP (1800 RPM) (IN.)]

2. A-CR-OS (OVERSPEED) (IN.)]

G. SERVICE DATA

1. OPER. TEMP. METAL TEMP. HUB (DEG.F)]

2. ESTIMATED MAX DA/DT (IN/HR)]

3. ESTIMATED MAX DA/DT (IN/MONTH)]

4. Crack Length Projected Til Inspection (in)]

5. Critical Crack Ratio (A ÷ Acr(os))]

H. INSPECTION STATUS

1. OPERATING TIME AT INSPECTION (HR.)]

2. KEYWAY CRACK DEPTH (MAX.)-(IN.)]

3. BORE CRACK DEPTH (MAX.)-(IN.)]

4. DISK STATUS]

C] INDICATES WESTINGHOUSE PROPRIETARY
LEVELS B,C,E

DATE OF REPORT : 092280

ID # : D080100903

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION		B. MATERIAL PROPERTIES (HUB)			C. MATERIAL PROPERTIES (RIM)		
1. BUILDING BLOCK	80	1. TYPE	TB				
2. UNIT	CALVERT CLIFFS #2	1MIN. Y.S. E	(KSI)				
3. CUSTOMER:	BALTIMORE G&E	2. SUPPLIER:	MIDVALE HEPPENSTALL				
4. LPH	2	3. Y.S. (KSI)			1. Y.S. (KSI)		
5. LOCATION	GOV	4. U.T.S. (KSI)			2. U.T.S. (KSI)		
6. DISC#	5	5. ELONGATION			3. ELONGATION		
7. TEST NO.	TN1528	6. R.A.			4. R.A.		
		7. FATT (DEG.F)			5. FATT (DEG.F)		
		8. R.T. IMPACT (FT.LB.)			6. R.T. IMPACT (FT.LB.)		
		9. U.S. IMPACT TEMP. (DEG.F)			7. U.S. IMPACT TEMP. (DEG.F)		
		10. U.S. IMPACT ENG. (FT.LB.)			8. U.S. IMPACT ENG. (FT.LB.)		
		11. U.S. KIC (KSI*SQRT(IN.))			9. U.S. KIC (KSI*SQRT(IN.))		
D. CHEMISTRY							
	C	MN	SI	P	CR	MO	V
	Ni	AS	SB	SN	AL	CU	S
E. BORE STRESS				F. CRACK DATA (KEYWAY RADIUS (IN.)			
SPEED (RPM)	STRESS						
1. 1800	(KSI) E			1. A-CR-06 (1800 RPM) (IN.) E			
2. 2160 (120*)	(KSI) E			2. A-CR-05 (OVERSPEED) (IN.) E			
G. SERVICE DATA							
1. OPER. TEMP. METAL TEMP. HUB (DEG.F)							
2. ESTIMATED MAX DA/DT (IN/HR)							
3. ESTIMATED MAX DA/DT (IN/MONTH)							
4. Crack Length Projected Till Inspection (in)							
5. Critical Crack Ratio (A ÷ Acr(0s))							
H. INSPECTION STATUS							
1. OPERATING TIME AT INSPECTION (HR.)							
2. KEYWAY CRACK DEPTH (MAX.)-(IN.)							
3. BORE CRACK DEPTH (MAX.)-(IN.)							
4. DISK STATUS							

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C J INDICATES WESTINGHOUSE PROPRIETARY LEVELS B,C,E

DATE OF REPORT : 092280

ID # : 0080100904

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION 80
 1. BUILDING BLOCK
 3. CUSTOMER: BALYMORE CLIFFS #2
 4. LP# LOCATION 2
 5. DISC# GEN
 7. TEST NO. YN1518

B. MATERIAL PROPERTIES (HUB) TB
 1. TYPE (MIN. Y.S. C (KSI))
 3. SUPPLIER: MIDVALE HEPPENSTALL
 4. U.T.S. (KSI)
 5. ELONGATION
 6. R.A.
 7. FAT. (DEG.F) (FT.LB.)
 8. R.T. IMPACT TEMP.
 9. U.S. IMPACT TEMP.
 10. U.S. IMPACT ENG. (DEG.F) (FT.LB.)
 11. U.S. KIC (KSI*SQRT(IN.))

C. MATERIAL PROPERTIES (RIM)
 1. Y.S. (KSI)
 2. U.T.S. (KSI)
 3. ELONGATION
 4. R.A.
 5. FAT. (DEG.F) (FT.LB.)
 6. R.T. IMPACT TEMP.
 7. U.S. IMPACT TEMP.
 8. U.S. IMPACT ENG. (DEG.F) (FT.LB.)
 9. U.S. KIC (KSI*SQRT(IN.))

D. CHEMISTRY C MN J C SI J C P J C CR J C MO J C V J
 NI C AS J C SB J C SM J C AL J C CU J C S J

E. BORE STRESS (RPM) STRESS
 1. 1800 (120X) (KSI) E J
 2. 2160 (120X) (KSI) E J

F. CRACK DATA (KEYWAY RADIUS (IN) E
 1. A-CR-05 (8000 RPM) (IN.) E J

G. SERVICE DATA
 1. OPER. TEMP. METAL TEMP. HUB (DEG.F) E J
 2. ESTIMATED MAX DA/DI (IN/HR) E J
 3. ESTIMATED MAX DA/DT (IN/MONTH) E J
 4. Crack Length Projected Till Inspection (in) ()
 5. Critical Crack Ratio (A ÷ Acr(0s)) ()

H. INSPECTION STATUS
 1. OPERATING TIME AT INSPECTION (HR.) E J
 2. KEYWAY CRACK DEPTH (MAX.)-(IN.) E J
 3. BORE CRACK DEPTH (MAX.)-(IN.) E J
 4. DISK STATUS E J

C 3 INDICATES WESTINGHOUSE PROPRIETARY
LEVELS B,C,E

DATE OF REPORT : 092280

ID # : D080100904

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION

1. BUILDING BLOCK 80
2. UNIT CALVERT CLIFFS #2
3. CUSTOMER: BALTIMORE G&E
4. LPM 2
5. LOCATION GEN
6. DISC# 2
7. TEST NO. TN1519

B. MATERIAL PROPERTIES (HUB)

1. TYPE (MIN. Y.S. [T8
[KSI])
2. SUPPLIER MIDVALE HEPPENSTALL
3. Y.S. (KSI)
4. U.T.S. (KSI)
5. ELONGATION
6. R.A.
7. FATT (DEG.F)
8. R.T. IMPACT (FT.LB.)
9. U.S. IMPACT TEMP. (DEG.F)
10. U.S. IMPACT ENG. (FT.LB.)
11. U.S. KIC (KSI*SQRT(IN.))

C. MATERIAL PROPERTIES (RIM)

1. Y.S. (KSI)
2. U.T.S. (KSI)
3. ELONGATION
4. R.A.
5. FATT (DEG.F)
6. R.T. IMPACT (FT.LB.)
7. U.S. IMPACT TEMP. (DEG.F)
8. U.S. IMPACT ENG. (FT.LB.)
9. U.S. KIC (KSI*SQRT(IN.))

D. CHEMISTRY

C MN SI P CR MO V
C C C C C C C
NI AS SB SN AL CU S
C C C C C C C

E. BORE STRESS

SPEED (RPM) STRESS

1. 1800 (KSI) C]
2. 2160 (120%) (KSI) C]

F. CRACK DATA (KEYWAY RADIUS (IN.) C]

1. A-CR-OP (1800 RPM) (IN.) C]
2. A-CR-OS (OVERSPEED) (IN.) C]

G. SERVICE DATA

1. OPER. TEMP. METAL TEMP. HUB (DEG.F) C]
2. ESTIMATED MAX DA/DT [(IN/HR) C]
3. ESTIMATED MAX DA/DT [(IN/MONTH) C]
4. Crack Length Projected T11 Inspection (in) []
5. Critical Crack Ratio (A ÷ Acr(os)) []

H. INSPECTION STATUS

1. OPERATING TIME AT INSPECTION (HR.) C]
2. KEYWAY CRACK DEPTH (MAX.)-(IN.) C]
3. BORE CRACK DEPTH (MAX.)-(IN.) C]
4. DISK STATUS C]

[] INDICATES WESTINGHOUSE PROPRIETARY LEVELS B,C,E

DATE OF REPORT : 092280

ID # : D080100904

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION		B. MATERIAL PROPERTIES (HUB)			C. MATERIAL PROPERTIES (RIM)		
1. BUILDING BLOCK	80	1. TYPE	MIN. Y.S. []	TB []	1. Y.S. (KSI)	[]	[]
2. UNIT	CALVERT CLIFFS #2	2. SUPPLIER	MIDVALE	HEPPENSTALL	2. U.T.S. (KSI)	[]	[]
3. CUSTOMER	BALTIMORE G&E	3. Y.S. (KSI)	[]	[]	3. ELONGATION	[]	[]
4. LP#	2	4. U.T.S. (KSI)	[]	[]	4. R.A.	[]	[]
5. LOCATION	GEN	5. ELONGATION	[]	[]	5. FATT (DEG.F)	[]	[]
6. DISC#	3	6. R.A.	[]	[]	6. R.T. IMPACT (FT.LB.)	[]	[]
7. TEST NO.	TN1520	7. FATT (DEG.F)	[]	[]	7. U.S. IMPACT TEMP. (DEG.F)	[]	[]
		8. R.T. IMPACT (FT.LB.)	[]	[]	8. U.S. IMPACT ENG. (FT.LB.)	[]	[]
		9. U.S. IMPACT TEMP. (DEG.F)	[]	[]	9. U.S. KIC (KSI*SQRT(IN.))	[]	[]
		10. U.S. IMPACT ENG. (FT.LB.)	[]	[]			
		11. U.S. KIC (KSI*SQRT(IN.))	[]	[]			

D. CHEMISTRY							
C	MN	SI	P	CR	MO	V	
NI	AS	SB	SN	AL	CU	S	

E. BORE STRESS		F. CRACK DATA (KEYWAY RADIUS (IN) [])	
SPEED (RPM)	STRESS (KSI) []	1. A-CR-OP (1000 RPM) (IN.) []	2. A-CR-OS (OVERSPEED) (IN.) []
1. 1800	[]		
2. 2160 (120%)	[]		

G. SERVICE DATA	
1. OPER. TEMP. METAL TEMP. HUB (DEG.F)	[]
2. ESTIMATED MAX DA/DT (IN/HR)	[]
3. ESTIMATED MAX DA/DT (IN/MONTH)	[]
4. Crack Length Projected Till Inspection (in)	[]
5. Critical Crack Ratio (A ÷ Acr(os))	[]

H. INSPECTION STATUS	
1. OPERATING TIME AT INSPECTION (HR.)	[]
2. KEYWAY CRACK DEPTH (MAX.) (IN.)	[]
3. BORE CRACK DEPTH (MAX.) (IN.)	[]
4. DISC STATUS	[]

C] INDICATES WESTINGHOUSE PROPRIETARY LEVELS B,C,E

DATE OF REPORT : 092280

ID # : 0080100904

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION

1. BUILDING BLOCK 80
 2. UNIT CALVERT CLIFFS #2
 3. CUSTOMER: BALTIMORE G&E
 4. LP# 2
 5. LOCATION GEN
 6. DISC# 5
 7. TEST NO. TN1522

B. MATERIAL PROPERTIES (HUB)

1. TYPE TB
 2. MIN. Y.S. C
 3. SUPPLIER: MIDVALE HEPPENSTALL
 4. U.T.S. (KSI)]
 5. ELONGATION]
 6. R.A.]
 7. FATT (DEG.F)]
 8. R.T. IMPACT (FT.LB.)]
 9. U.S. IMPACT TEMP. (DEG.F)]
 10. U.S. IMPACT ENG. (FT.LB.)]
 11. U.S. KIC (KSI*SQRT(IN.))]

C. MATERIAL PROPERTIES (RIM)

1. Y.S. (KSI)]
 2. U.T.S. (KSI)]
 3. ELONGATION]
 4. R.A.]
 5. FATT (DEG.F)]
 6. R.T. IMPACT (FT.LB.)]
 7. U.S. IMPACT TEMP. (DEG.F)]
 8. U.S. IMPACT ENG. (FT.LB.)]
 9. U.S. KIC (KSI*SQRT(IN.))]

D. CHEMISTRY

C] MN] SI] P] CR] MO] V]
 NI] AS] SB] SN] AL] CU] S]

E. BORE STRESS
 SPEED (RPM) STRESS

1. 1800 (KSI)]
 2. 2160 (120%) (KSI)]

F. CRACK DATA (KEYWAY RADIUS (IN.)]

1. A-CR-0P (1800 RPM) (IN.)]
 2. A-CR-05 (OVERSPEED) (IN.)]

G. SERVICE DATA

1. OPER. TEMP. METAL TEMP. HUB (DEG.F)]
 2. ESTIMATED MAX DA/DT ((N/HR)]
 3. ESTIMATED MAX DA/DT ((N/MONTH)]
 4. Crack Length Projected T11 Inspection (in)]
 5. Critical Crack Ratio (A ÷ Acr(os))]

H. INSPECTION STATUS

1. OPERATING TIME AT INSPECTION (HR.)]
 2. KEYWAY CRACK DEPTH (MAX.)-(IN.)]
 3. BORE CRACK DEPTH (MAX.)-(IN.)]
 4. DISK STATUS]

[] INDICATES WESTINGHOUSE PROPRIETARY LEVELS B,C,E

DATE OF REPORT : 092280

ID # : 0080100904

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION

1. BUILDING BLOCK 80
 2. UNIT CALVERT CLIFFS #2
 3. CUSTOMER: BALTIMORE G&E
 4. LPM 2
 5. LOCATION GEN
 6. DISC# 6
 7. TEST NO. YN1523

B. MATERIAL PROPERTIES (HUB)

1. TYPE (MIN. Y.S. E TA (KSI))
 2. SUPPLIER: MIDVALE HEPPENSTALL
 3. Y.S. (KSI)
 4. U.T.S. (KSI)
 5. ELONGATION
 6. R.A.
 7. FATT (DEG.F)
 8. R.T. IMPACT (FT.LB.)
 9. U.S. IMPACT TEMP. (DEG.F)
 10. U.S. IMPACT ENG. (FT.LB.)
 11. U.S. KIC (KSI*SQRT(IN.))

C. MATERIAL PROPERTIES (RIM)

1. Y.S. (KSI)
 2. U.T.S. (KSI)
 3. ELONGATION
 4. R.A.
 5. FATT (DEG.F)
 6. R.T. IMPACT (FT.LB.)
 7. U.S. IMPACT TEMP. (DEG.F)
 8. U.S. IMPACT ENG. (FT.LB.)
 9. U.S. KIC (KSI*SQRT(IN.))

D. CHEMISTRY

C MN SI P CR MO V
 AS SB SN AL CU S

E. BORE STRESS

SPEED (RPM) STRESS
 1. 1800 (KSI) E
 2. 2160 (120%) (KSI) E

F. CRACK DATA (KEYWAY RADIUS (IN) E)

1. A-CR-OP (1800 RPM) (IN.) E
 2. A-CR-OS (OVERSPEED) (IN.) E

G. SERVICE DATA

1. OPER. TEMP. METAL TEMP. HUB (DEG.F) E
 2. ESTIMATED MAX DA/DT (IN/HR) E
 3. ESTIMATED MAX DA/DT (IN/MONTH) E
 4. Crack Length Projected Til Inspection (in) []
 5. Critical Crack Ratio (A ÷ Acr(os)) []

H. INSPECTION STATUS

1. OPERATING TIME AT INSPECTION (HR.) E
 2. KEYWAY CRACK DEPTH (MAX.) (IN.) E
 3. BORE CRACK DEPTH (MAX.) (IN.) E
 4. DISK STATUS C

E] INDICATES WESTINGHOUSE PROPRIETARY LEVELS B,C,E

DATE OF REPORT : 092280

ID # : D080100905

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION

1. BUILDING BLOCK 80
 2. UNIT CALVERT CLIFFS #2
 3. CUSTOMER: BALTIMORE G&E
 4. LPM 3
 5. LOCATION GOV
 6. DISC# 2
 7. TEST NO. TN1537

B. MATERIAL PROPERTIES (HUB)

1. TYPE TB
 1MIN. Y.S. [] (KSI)
 2. SUPPLIER: MIDVALE HEPPENSTALL
 3. Y.S. [] (KSI)
 4. U.T.S. [] (KSI)
 5. ELONGATION []
 6. R.A. []
 7. FATT (DEG.F) []
 8. R.T. IMPACT (FT.LB.) []
 9. U.S. IMPACT TEMP. (DEG.F) []
 10. U.S. IMPACT ENG. (FT.LB.) []
 11. U.S. KIC (KSI*SQRT(IN.)) []

C. MATERIAL PROPERTIES (RIM)

1. Y.S. [] (KSI)
 2. U.T.S. [] (KSI)
 3. ELONGATION []
 4. R.A. []
 5. FATT (DEG.F) []
 6. R.T. IMPACT (FT.LB.) []
 7. U.S. IMPACT TEMP. (DEG.F) []
 8. U.S. IMPACT ENG. (FT.LB.) []
 9. U.S. KIC (KSI*SQRT(IN.)) []

D. CHEMISTRY

C MN SI P CR MO V
 NI AS SB SN AL CU S

E. BORE STRESS

SPEED (RPM) STRESS

1. 1800 (KSI) []
 2. 2160 (120%) (KSI) []

F. CRACK DATA (KEYWAY RADIUS (IN) [])

1. A-CR-0P (1800 RPM) (IN.) []
 2. A-CR-0S (OVERSPEED) (IN.) []

G. SERVICE DATA

1. OPER. TEMP. METAL TEMP. HUB (DEG.F) []
 2. ESTIMATED MAX DA/DT (IN/HR) []
 3. ESTIMATED MAX DA/DT (IN/MONTH) []
 4. Crack Length Projected Til Inspection (in) []
 5. Critical Crack Ratio (A + Acr(08)) []

H. INSPECTION STATUS

1. OPERATING TIME AT INSPECTION (HR.) []
 2. KEYWAY CRACK DEPTH (MAX.)-(IN.) []
 3. BORE CRACK DEPTH (MAX.)-(IN.) []
 4. DISK STATUS []

E 3 INDICATES WESTINGHOUSE PROPRIETARY LEVELS B,C,E

DATE OF REPORT : 092280

ID # : D08C100905

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION

1. BUILDING BLOCK 80
 2. UNIT CALVERT CLIFFS #2
 3. CUSTOMER: BALTIMORE G6E
 4. LP# 3
 5. LOCATION GOV
 6. DISC# 3
 7. TEST NO. TN1538

B. MATERIAL PROPERTIES (HUB)

1. TYPE (MIN. Y.S. (KSI)) TB
 2. SUPPLIER: MIDVALE HEPPENSTALL
 3. Y.S. (KSI)
 4. U.T.S. (KSI)
 5. ELONGATION
 6. R.A.
 7. FATT (DEG.F)
 8. R.T. IMPACT (FT.LB.)
 9. U.S. IMPACT TEMP. (DEG.F)
 10. U.S. IMPACT ENG. (FT.LB.)
 11. U.S. KIC (KSI*SQRT(IN.))

C. MATERIAL PROPERTIES (RIM)

1. Y.S. (KSI)
 2. U.T.S. (KSI)
 3. ELONGATION
 4. R.A.
 5. FATT (DEG.F)
 6. R.T. IMPACT (FT.LB.)
 7. U.S. IMPACT TEMP. (DEG.F)
 8. U.S. IMPACT ENG. (FT.LB.)
 9. U.S. KIC (KSI*SQRT(IN.))

D. CHEMISTRY

C MN SI P CR MO V
 NI AS SB SN AL CU S

E. BORE STRESS SPEED (RPM) STRESS

1: 1800 (KSI) []
 2: 2160 (120%) (KSI) []

F. CRACK DATA (KEYWAY RADIUS (IN.) [])

1: A-CR-0P (1800 RPM) (IN.) []
 2: A-CR-0S (OVERSPEED) (IN.) []

G. SERVICE DATA

1. OPER. TEMP. METAL TEMP. HUB (DEG.F) []
 2. ESTIMATED MAX DA/DT (IN/HR) []
 3. ESTIMATED MAX DA/DT (IN/MONTH) []
 4. Crack Length Projected Til Inspection (in) []
 5. Critical Crack Ratio (A ÷ Acr(0s)) []

H. INSPECTION STATUS

1. OPERATING TIME AT INSPECTION (HR.) []
 2. KEYWAY CRACK DEPTH (MAX.)-(IN.) []
 3. BORE CRACK DEPTH (MAX.)-(IN.) []
 4. DISK STATUS C []

C] INDICATES WESTINGHOUSE PROPRIETARY LEVELS B,C,E

DATE OF REPORT : 092280

ID # : D080100905

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION		B. MATERIAL PROPERTIES (HUB)			C. MATERIAL PROPERTIES (RIM)		
1. BUILDING BLOCK	80	1. TYPE	TB	1. Y.S. (KSI)			
2. UNIT	CALVERT CLIFFS #2	(MIN. Y.S. (KSI))		2. U.T.S. (KSI)			
3. CUSTOMER:	BALTIMORE G&E	2. SUPPLIER:	MIDVALE HEPPESTALL	3. ELONGATION			
4. LPM	3	3. Y.S. (KSI)		4. R.A.			
5. LOCATION	GOV	4. U.T.S. (KSI)		5. FATT (DEG.F)			
6. DISC#	4	5. ELONGATION		6. R.T. IMPACT (FT.LB.)			
7. TEST NO.	TN1539	6. R.A.		7. U.S. IMPACT TEMP. (DEG.F)			
		7. FATT (DEG.F)		8. U.S. IMPACT ENG. (FT.LB.)			
		8. R.T. IMPACT (FT.LB.)		9. U.S. KIC (KSI*SQRT(IN.))			
		9. U.S. IMPACT TEMP. (DEG.F)					
		10. U.S. IMPACT ENG. (FT.LB.)					
		11. U.S. KIC (KSI*SQRT(IN.))					

D. CHEMISTRY							
C	MN	SI	P	CR	MO	V	
NI	AS	SB	SH	AL	CU	S	

E. BORE STRESS			F. CRACK DATA (KEYWAY RADIUS (IN))		
SPEED (RPM)	STRESS		1. A-CR-OP (1800 RPM) (IN.)		
1. 1800	(KSI) E		2. A-CR-OS (OVERSPEED) (IN.)	E	
2. 2160 (120%)					

G. SERVICE DATA		
1. OPER. TEMP. METAL TEMP. HUB (DEG.F)		
2. ESTIMATED MAX DA/DT (IN/HR)		
3. ESTIMATED MAX DA/DT (IN/MONTH)		
4. Crack Length Projected Til Inspection (in)		
5. Critical Crack Ratio (A ÷ Acr(0s))		

H. INSPECTION STATUS		
1. OPERATING TIME AT INSPECTION (HR.)		
2. KEYWAY CRACK DEPTH (MAX.)-(IN.)		
3. BORE CRACK DEPTH (MAX.)-(IN.)		
4. DISK STATUS		

C 3 INDICATES WESTINGHOUSE PROPRIETARY LEVELS B,C,E

DATE OF REPORT : 092280

ID # : 0080100905

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION		B. MATERIAL PROPERTIES (HUB)		C. MATERIAL PROPERTIES (RIM)	
1. BUILDING BLOCK	80	1. TYPE	TA	1. Y.S. (KSI)	J
2. UNIT	CALVERT CLIFFS #2	2. SUPPLIER	MIDVALE HEPPENSTALL	2. U.T.S. (KSI)	J
3. CUSTOMER	BALTIMORE G&E	3. Y.S. (KSI)		3. ELONGATION	J
4. LPH	3	4. U.T.S. (KSI)		4. R.A.	J
5. LOCATION	GOV	5. ELONGATION		5. FATT (DEG.F)	J
6. DISC#	6	6. R.A.		6. R.T. IMPACT (FT.LB.)	J
7. TEST NO.	TN1541	7. FATT (DEG.F)		7. U.S. IMPACT TEMP. (DEG.F)	J
		8. R.T. IMPACT (FT.LB.)		8. U.S. IMPACT ENG. (FT.LB.)	J
		9. U.S. IMPACT TEMP. (DEG.F)		9. U.S. KIC (KSI*SQRT(LIN.))	J
		10. U.S. IMPACT ENG. (FT.LB.)			
		11. U.S. KIC (KSI*SQRT(LIN.))			
D. CHEMISTRY					
	C MN		SI P		CR HO V
	NI AS		SB SN		AL CU S
E. BORE STRESS		F. CRACK DATA (KEYWAY RADIUS (IN.)			
SPEED (RPM)	STRESS				
1. 1800	(KSI) E		1. A-CR-OP (1800 RPM) (IN.)	E	J
2. 2160 (120%)	(KSI) E		2. A-CR-OS (OVERSPEED) (IN.)	E	J
G. SERVICE DATA					
1. OPER. TEMP. METAL TEMP. HUB (DEG.F)					
2. ESTIMATED MAX DA/DT (IN/HR)					
3. ESTIMATED MAX DA/DT (IN/MONTH)					
4. Crack Length Projected Til Inspection (in)					
5. Critical Crack Ratio (A -> Acr(os))					
H. INSPECTION STATUS					
1. OPERATING TIME AT INSPECTION (HR.)					
2. KEYWAY CRACK DEPTH (MAX.)-(IN.)					
3. BORE CRACK DEPTH (MAX.)-(IN.)					
4. DISK STATUS					

C] INDICATES WESTINGHOUSE PROPRIETARY
LEVELS B,C,E

DATE OF REPORT : 092280

ID # : D080100906

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION			B. MATERIAL PROPERTIES (HUB)			C. MATERIAL PROPERTIES (RIM)		
1. BUILDING BLOCK	80		1. TYPE	TE				
2. UNIT	CALVERT CLIFFS #2		1. MIN. Y.S. (KSI)	(KSI)		1. Y.S. (KSI)		
3. CUSTOMER	BALTIMORE G&E		2. SUPPLIER	MIDVALE HEPPENSTALL		2. U.T.S. (KSI)		
4. LPM	3		3. Y.S. (KSI)			3. ELONGATION		
5. LOCATION	GEN		4. U.T.S. (KSI)			4. R.A.		
6. DISC#	1		5. ELONGATION			5. FATT (DEG.F)		
7. TEST NO.	YN1530		6. R.A.			6. R.T. IMPACT (FT.LB.)		
			7. FATT (DEG.F)			7. U.S. IMPACT TEMP. (DEG.F)		
			8. R.T. IMPACT (FT.LB.)			8. U.S. IMPACT ENG. (FT.LB.)		
			9. U.S. IMPACT TEMP. (DEG.F)			9. U.S. KIC (KSI*SQRT(IN.))		
			10. U.S. IMPACT ENG. (FT.LB.)					
			11. U.S. KIC (KSI*SQRT(IN.))					
D. CHEMISTRY								
	C	MN	SI	P	CR	MO	V	
	NI	AS	SB	SN	AL	CU	S	
E. BORE STRESS				F. CRACK DATA (KEYWAY RADIUS (IN.)				
	SPEED (RPM)	STRESS						
1.	1800	(KSI)		1.	A-CR-OP (1800 RPM) (IN.)			
2.	2160 (120%)	(KSI)		2.	A-CR-OS (OVERSPEED) (IN.)			
G. SERVICE DATA								
1.	OPER. TEMP. METAL TEMP. HUB (DEG.F)							
2.	ESTIMATED MAX DA/DT (IN/HR)							
3.	ESTIMATED MAX DA/DT (IN/MONTH)							
4.	Crack Length Projected Til Inspection (IN.)							
5.	Critical Crack Ratio (A ÷ Acr(os))							
H. INSPECTION STATUS								
1.	OPERATING TIME AT INSPECTION (HR.)							
2.	KEYWAY CRACK DEPTH (MAX.)-(IN.)							
3.	BORE CRACK DEPTH (MAX.)-(IN.)							
4.	DISK STATUS							

C] INDICATES WESTINGHOUSE PROPRIETARY
LEVELS B,C,E

DATE OF REPORT : 092280

ID # : D080100906

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION		B. MATERIAL PROPERTIES (HUB)			C. MATERIAL PROPERTIES (RIM)		
1. BUILDING BLOCK	80	1. TYPE	MIN. Y.S. (KSI)	TB	1. Y.S. (KSI)		
2. UNIT	CALVERT CLIFFS #2	2. SUPPLIER	MIDVALE	HEPPENSTALL	2. U.T.S. (KSI)		
3. CUSTOMER	BALTIMORE 66E	3. Y.S. (KSI)			3. ELONGATION		
4. LP#	3	4. U.T.S. (KSI)			4. R.A.		
5. LOCATION	3 GEN	5. ELONGATION			5. FATT (DEG.F)		
6. DISC#	3	6. R.A.			6. R.T. IMPACT (FT.LB.)		
7. TEST NO.	TN1532	7. FATT (DEG.F)			7. U.S. IMPACT TEMP.		
		8. R.T. IMPACT (FT.LB.)			8. U.S. IMPACT (DEG.F)		
		9. U.S. IMPACT TEMP.			9. U.S. IMPACT ENG. (FT.LB.)		
		10. U.S. IMPACT ENG. (FT.LB.)			11. U.S. KIC (KSI*SQRT(IN.))		
		11. U.S. KIC (KSI*SQRT(IN.))					
D. CHEMISTRY							
	C	MN	SI	P	CR	HQ	V
	N	AS	SB	SN	AL	CU	S
E. BORE STRESS				F. CRACK DATA (KEYWAY RADIUS (IN))			
SPEED (RPM)	STRESS			1. A-CR-02 (1800 RPM)	(IN.)		
1: 1800	(KSI)			2: A-CR-05 (OVERSPEED)	(IN.)		
2: 2160 (120%)							
G. SERVICE DATA							
1. OPER. TEMP. METAL TEMP. HUB (DEG.F)							
2. ESTIMATED MAX DA/DT (IN/HR)							
3. ESTIMATED MAX DA/DT (IN/MONTH)							
4. Crack Length Projected Til Inspection (in)							
5. Critical Crack Ratio (A ÷ Acr(0s))							
H. INSPECTION STATUS							
1. OPERATING TIME AT INSPECTION (HR.)							
2. KEYWAY CRACK DEPTH (MAX.)-(IN.)							
3. BORE CRACK DEPTH (MAX.)-(IN.)							
4. DISK STATUS							

E 3 INDICATES WESTINGHOUSE PROPRIETARY
LEVELS B,C,E

DATE OF REPORT : 092280

ID # : D080100906

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION

1. BUILDING BLOCK 80
2. UNIT CALVERT CLIFFS #2
3. CUSTOMER: BALTIMORE G&E
4. LPM 3
5. LOCATION GEN
6. DISC# 4
7. TEST NO. TN1521

B. MATERIAL PROPERTIES (HUB)

1. TYPE TB
(MIN. Y.S. E (KSI))
2. SUPPLIER: MIDVALE HEPPENSTALL
3. Y.S. (KSI) E
4. U.T.S. (KSI) E
5. ELONGATION E
6. R.A. E
7. FATT (DEG.F) E
8. R.T. IMPACT (FT.LB.) E
9. U.S. IMPACT TEMP. (DEG.F) E
10. U.S. IMPACT ENG. (FT.LB.) E
11. U.S. KIC (KSI*SQRT(IN.)) E

C. MATERIAL PROPERTIES (RIM)

1. Y.S. (KSI) E
2. U.T.S. (KSI) E
3. ELONGATION E
4. R.A. E
5. FATT (DEG.F) E
6. R.T. IMPACT (FT.LB.) E
7. U.S. IMPACT TEMP. (DEG.F) E
8. U.S. IMPACT ENG. (FT.LB.) E
9. U.S. KIC (KSI*SQRT(IN.)) E

D. CHEMISTRY

C MN SI P CR HO V
NI AS SB SM AL CU S

E. BORE STRESS

SPEED (RPM) STRESS

1. 1800 (KSI) E
2. 2160 (120%) (KSI) E

F. CRACK DATA (KEYWAY RADIUS (IN) E)

1. A-CR-OP (1800 RPM) (IN.) E
2. A-CR-OS (OVERSPEED) (IN.) E

G. SERVICE DATA

1. OPER. TEMP. METAL TEMP. HUB (DEG.F) E
2. ESTIMATED MAX DA/DT (IN/HR) E
3. ESTIMATED MAX DA/DT (IN/MONTH) E
4. Crack Length Projected Til Inspection (in) E
5. Critical Crack Ratio (A ÷ Acr(os)) E

H. INSPECTION STATUS

1. OPERATING TIME AT INSPECTION (HR.) E
2. KEYWAY CRACK DEPTH (MAX.)-(IN.) E
3. BORE CRACK DEPTH (MAX.)-(IN.) E
4. DISK STATUS E

E 3 INDICATES WESTINGHOUSE PROPRIETARY LEVELS B,C,E

DATE OF REPORT : 092280

ID # : 0080100906

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION

1. BUILDING BLOCK 80
 2. UNIT CALVERT CLIFFS #2
 3. CUSTOMER: BALTIMORE G&E
 4. LPM 3
 5. LOCATION GEN
 6. DISC# 6
 7. TEST NO. TN1535

B. MATERIAL PROPERTIES (HUB)

1. TYPE (MIN. Y.S. C) TA
 2. SUPPLIER (KSI) MIDVALE HERRPENS:ALL
 3. Y.S. (KSI)
 4. U.T.S. (KSI)
 5. ELONGATION
 6. R.A.
 7. FATT (DEG.F)
 8. R.T. IMPACT (FT.LB.)
 9. U.S. IMPACT TEMP. (DEG.F)
 10. U.S. IMPACT ENG. (FT.LB.)
 11. U.S. KIC (KSI*SQRT(IN.))

C. MATERIAL PROPERTIES (RIM)

1. Y.S. (KSI)
 2. U.T.S. (KSI)
 3. ELONGATION
 4. R.A.
 5. FATT (DEG.F)
 6. R.T. IMPACT (FT.LB.)
 7. U.S. IMPACT TEMP. (DEG.F)
 8. U.S. IMPACT ENG. (FT.LB.)
 9. U.S. KIC (KSI*SQRT(IN.))

D. CHEMISTRY

C MN SI P CR MO V
 NI AS SB SN AL CU S

E. BORE STRESS

SPEED (RPM) STRESS
 1. 1800 (KSI) E
 2. 2160 (120%) (KSI) E

F. CRACK DATA (KEYWAY RADIUS (IN) E

1. A-CR-0P (1800 RPM) (IN.) E
 2. A-CR-05 (OVERSPEED) (IN.) E

G. SERVICE DATA

1. OPER. TEMP. METAL TEMP. HUB (DEG.F) E
 2. ESTIMATED MAX DA/DT (IN/HR) E
 3. ESTIMATED MAX DA/DT (IN/MONTH) E
 4. Crack Length Projected Til Inspection (in) E
 5. Critical Crack Ratio (A ÷ Acr(os)) E

H. INSPECTION STATUS

1. OPERATING TIME AT INSPECTION (HR.) E
 2. KEYWAY CRACK DEPTH (MAX.)-(IN.) E
 3. BORE CRACK DEPTH (MAX.)-(IN.) E
 4. DISK STATUS C