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FACIL:50-250 Turkey Point Plant, Unit 3, Florida Power and Light C 05000250

AUTH.NAME	AUTHOR AFFILIATION
UHRIG,R.E.	Florida Power & Light Co.

RECIP.NAME	RECIPIENT AFFILIATION
EISENHUT,D.G.	Division of Operating Reactors

SUBJECT: Forwards response to NRC 800225 ltr re disc integrity in Westinghouse 1800 RPM low pressure nuclear turbine. Application for withholding proprietary info & affidavit encl.Portion of response (ref 10CFR2.790).

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	OELD	1	0	STS GROUP LEADR	1	0
EXTERNAL:	19 ACRS	16	16	LPDR	1	~~0~~ NP
	NSIC	1	~~0~~ NP	SMITH,H. W/AFF	1	0

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

MEMORANDUM FOR: TERA Corp.

FROM: US NRC/TIDC/Distribution Services Branch

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- ☐ Other: (specify)

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TIDC/DSB Authorized Signature

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FPL

FLORIDA POWER & LIGHT COMPANY

March 20, 1980
L-80-92

Office of Nuclear Reactor Regulation
Attention: Mr. Darrell G. Eisenhut, Acting Director
Division of Operating Reactors
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Eisenhut:

Re: Turkey Point Unit 3
Docket No. 50-250
Turbine Rotors

Florida Power & Light Company (FP&L) has reviewed your letter dated February 25, 1980 requesting information relative to disc integrity in Westinghouse 1800 RPM low pressure nuclear turbines. Specifically, your request attached a set of six site-specific questions and a second set of eight generic questions. Your letter also urged that the generic questions be addressed through an owners group. As requested, responses to the generic questions were coordinated through a task force, of which FP&L is a member, which is chaired by Mr. Wayne Stiede of Commonwealth Edison. It is our understanding that Westinghouse will submit responses to the generic questions directly to your office and that you are in agreement with this method of submittal.

As a result of discussions at an industry Task Force meeting in Tampa, Florida on March 12-13, 1980, we understand that a site-specific information submittal date of March 19, 1980 is acceptable to the NRC. Such information is provided in Attachment 3. Please note that the LP rotor discs on Turkey Point Unit 3 were replaced with new rotors of improved design during the refueling outage that ended in late January, 1980.

Please note that our response contains information considered to be proprietary by the Westinghouse Electric Corporation. In conformance with 10 CFR 2.790, as amended, we are also forwarding an APPLICATION FOR WITHHOLDING INFORMATION FROM PUBLIC DISCLOSURE (Attachment 1) and an Affidavit (Attachment 2). The affidavit sets forth the basis on which the proprietary information contained in Attachment 3 may be withheld from public disclosure by the Commission.

PA01 3/3
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W ROSS
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BC (2)

CHANGE: LE
NRCPDR: NP
LPDR: NP
NSIC: NP

P

8003260 381.

Correspondence with respect to the affidavit or application for withholding should reference AW-80-19 and should be addressed to Mr. R. Williamson, Manager, Customer Order Engineering, Westinghouse Electric Corporation, Steam Turbine Divisions Lester Branch Box 9175, Philadelphia, Pa. 19113.

Very truly yours,

Robert E. Uhrig
Vice President
Advanced Systems & Technology

REU/DKJ/cph

Attachments (3)

cc: Mr. J. P. O'Reilly, Region II
Harold Reis, Esquire

DOCKET NO. 50-250
DATE: 80/08/27

NOTE TO NRC AND/OR LOCAL PUBLIC DOCUMENT ROOMS

The following item submitted with letter dated 80/03/20 from Florida Pwr & Light Co. is being withheld from public disclosure in accordance with Section 2.790.

PROPRIETARY INFORMATION

Ltr re disc integrity in low pressure nuclear turbine

Distribution Service's Branch

Attachment 1

Application for Withholding Proprietary Information from Public Disclosure

AW-80-19

March 14, 1980

Darrell G. Eisenhut
Division of Operating Reactors
Office of Nuclear Reactor Regulation
US Nuclear Regulatory Commission
Washington DC 20555

APPLICATION FOR WITHHOLDING PROPRIETARY INFORMATION FROM PUBLIC DISCLOSURE

Subject: Turkey Point #3 and 4 Docket #50-250, 50-251, St. Lucie 50-335 Information in Response to NRC Request for Information of February 25, 1980, Relative to Low Pressure Turbine Disc Integrity.

Reference: Appendix A letter from R. E. Uhrig to Eisenhut, dated 3/19/80

Dear Mr. Eisenhut:

This application for withholding is submitted by Westinghouse Electric Corporation ("Westinghouse") pursuant to the provisions of paragraph (b)(1) of Section 2.790 of the Commission's regulations. Withholding from public disclosure is requested with respect to the subject information which is further identified in the affidavit accompanying this application.

The undersigned has reviewed the information sought to be withheld and is authorized to apply for its withholding on behalf of Westinghouse, STG-TOD.

The affidavit accompanying this application sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of Section 2.790 of the Commission's regulations.

Accordingly, it is respectfully requested that the subject information which is proprietary to Westinghouse and which is further identified in the affidavit be withheld from public disclosure in accordance with 10CFR Section 2.790 of the Commission's regulations.

Correspondence with respect to this application for withholding or the accompanying affidavit should be addressed to the undersigned.

Very truly yours,

Robert W Williamson

R. Williamson, Manager
Customer Order Engineering
Westinghouse Electric Corporation

Attachment 2

Affidavit in Support of Application for Withholding Proprietary Information from Public Disclosure

Ref: [illegible]W-80-19

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA
COUNTY OF DELAWARE:

Before me, the undersigned authority, personally appeared Robert Williamson, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of Westinghouse Electric Corporation ("Westinghouse") and that the averments of fact set forth in this Affidavit are true and correct to the best of his knowledge, information, and belief:

Robert W Williamson

Robert Williamson, Manager
Customer Order Engineering

Sworn to and subscribed before me
this 15 day of Mar 19 80

Henry E. Squillace

HENRY E. SQUILLACE
Notary Public, Marple Twp., Delaware Co.
My Commission Expires Oct. 18, 1980

(1) I am Manager, Customer Order Engineering in the Steam Turbine Generator Technical Operations Division of Westinghouse Electric Corporation and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing, and am authorized to apply for its withholding on behalf of the Westinghouse Power Generation Divisions.

(2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.790 of the Commission's regulations and in conjunction with the Westinghouse application for withholding accompanying this Affidavit.

(3) I have personal knowledge of the criteria and procedures utilized by Westinghouse Power Generation Divisions in designating information as a trade secret, privileged or as confidential commercial or financial information.

(4) Pursuant to the provisions of paragraph (b)(4) of Section 2.790 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.

(i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse.

(ii) The information is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public. Westinghouse has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitutes Westinghouse policy and provides the rational basis required.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

(a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.

(b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage, e.g., by optimization or improved marketability.

(c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.

(d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.

(e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.

(f) It contains patentable ideas, for which patent protection may be desirable.

(g) It is not the property of Westinghouse, but must be treated as proprietary by Westinghouse according to agreements with the owner.

(h) Public disclosure of this information would allow unfair and untruthful judgments on the performance and reliability of Westinghouse equipment components and improper comparison with similar components made by competitors.

There are sound policy reasons behind the Westinghouse system which include the following:

(a) The use of such information by Westinghouse gives Westinghouse a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Westinghouse competitive position.

(b) It is information which is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.

(c) Use by our competitor would put Westinghouse at a competitive disadvantage by reducing his expenditure of resources at our expense.

(d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Westinghouse of a competitive advantage.

(e) Unrestricted disclosure would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition in those countries.

(f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.

(iii) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.790, it is to be received in confidence by the Commission.

(iv) The information is not available in public sources to the best of our knowledge and belief.

(v) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in Appendix A to letter from R. E. Uhrig to Eisenhut, dated March 19, 1980 concerning information in response to NRC request for information of February 25, 1980, relative to low pressure turbine disc integrity.

The information enables Westinghouse to:

(a) Develop test inputs and procedures to satisfactorily verify the design of Westinghouse supplied equipment.

(b) Assist its customers to obtain licenses.

Further, the information has substantial commercial value as follows.

(a) Westinghouse can sell the use of this information to customers.

(b) Westinghouse uses the information to verify the design of equipment which is sold to customers.

(c) Westinghouse can sell services based upon the experience gained and the test equipment and methods developed.

Public disclosure of this information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to design, manufacture, verify, and sell electrical equipment for commercial turbine-generators without commensurate expenses. Also, public disclosure of the information would enable others having the same or similar equipment to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

The development of the equipment described in part by the information is the result of many years of development by Westinghouse and the expenditure of a considerable sum of money.

This could only be duplicated by a competitor if he were to invest similar sums of money and provided he had the appropriate talent available and could somehow obtain the requisite experience.

Further the deponent sayeth not.

ATTACHMENT 3

RESPONSE TO NRC REQUEST FOR INFORMATION
RELATED TO TURBINE DISCS
SITE-SPECIFIC GENERAL QUESTIONS

I. LP Turbine design and operating data:

A. Turbine type:

The Florida Power & Light Company, Turkey Point #3 unit consists of one tandem compound four flow, three casings, condensing, 1800 RPM turbine utilizing 44 in. last row blades in each low pressure element. The low pressure element is designated as a Building Block 81.

B. Hours of operation for each LP Turbine:

As you are aware, refurbished (crack-free) LP rotors were installed in the Unint 3 turbine early in 1980. These rotors have operated a total of 984 hours as of midnight, March 17, 1980. Based on current Westinghouse inspection criteria, an inspection of the Unit 3 LP rotors would be indicated based on the 5-year operating criterion

rather than the postulated crack size criterion. Unit 3 will not achieve 5 years of operation on the LP rotors until early 1984. However, we would expect that the inspection criteria would change as the inspection data base grows. The Disc Task Force is currently attempting to schedule a meeting with the NRC and Westinghouse to discuss both inspection criteria and crack growth rate. A more realistic schedule for a Unit 3 inspection could be postulated following such a meeting.

C. Number of turbine trips and overspeeds:

Based on the limited review predicated by the required response time, our records indicate that Unit 3 has undergone 3 overspeed trips and a maximum of 89 turbine trips from power operation. The 3 overspeed trips were the result of required testing of the overspeed trip device, and the 89 turbine trips reported are based on records of reactor trips. As reactor trips at low power levels will not necessarily involve a turbine trip, this number (89) is also subject to revision. We will continue our review of existing records and advise you of any changes to this response resulting from this review.

D. Information pertaining to each disc:

1. Type of material including material specifications:

The material specified is Ni-Cr-Mo-V alloy steel similar to that

specified as ASTM A-471. The material properties for each disc are included in sections A, B, and C of Appendix A (attached).

2. Tensile properties data:

Tensile properties data determined from testing of hub and rim material are also included in Sections B and C of Appendix A.

3. Toughness properties data including Fracture Appearance Transition Temperature and Upper Energy and Temperature:

These properties are also included in Sections B and C of Appendix A. Note that Upper Shelf Energy is not listed when the value is identical to the Room Temperature Energy.

4. Keyway temperatures:

Keyway temperatures are listed in Section G of the Appendix A data for each disc. This is the calculated temperature two inches from the exhaust face of the disc at the bore during full load operation with all moisture separator reheaters functioning. Note that this value, as the major input into the calculation of crack growth rate, is only valid for calculational purposes for those discs which in normal operation run "wet". Westinghouse data indicates that no bore or keyway cracking has occurred in discs that run "dry".

5. Calculated keyway crack size for turbine operating time in I.B. above:

See item I.D.4. The calculated crack size is a function of the estimated maximum crack growth rate, based on empirical data, and the equipment operating hours. This value, based on current NRC criteria, is given in Section G of Appendix A. Recent Westinghouse research and analyses have yielded conclusions that differ significantly from those values based on current NRC criteria. A summation of results pursuant to these conclusions, which also address items I.D.6, 7, and 8, is appended (Appendix B). Our response is based, where applicable, on these conclusions.

6. Critical crack size:

See item I.D.5. above.

7. Ratio of calculated crack to critical crack size:

See item I.D.5. above.

8. Crack growth rate:

See items I.D.4. and I.D.5. above.

9. Calculated bore and keyway stress at operating design overspeed:

The bore tangential stresses at design speed and design overspeed are presented in Section E of Appendix A. The values presented include the stresses due to shrink fitting and centrifugal force loads only. Additional analyses to include thermal stresses and pressure stresses are being performed but are presently not available. Keyway stresses vary from zero to a high fraction of yield strength.

10. Calculated K_{1C} data:

The fracture toughness, K_{1C}, of each disc is calculated from the Charpy V-notch and tensile data. These values, presented in Sections B.11. and C.9. of Appendix A are calculated at either the Upper Shelf Temperature or room temperature, whichever yields the lower result.

11. Minimum yield strength specified for each disc:

The minimum yield strength for each disc is presented in Section B.1 of Appendix A.

II. Results of completed inservice inspections:

As indicated in Section I.B. the Unit 3 rotors were completely refurbished. Details of the refurbishment, including inspections performed, were forwarded in our letter of January 23, 1980.

III. Provide the nominal water chemistry conditions for each LP turbine and describe any condenser inleakages or other significant changes in secondary water chemistry to this point in its operating life. Discuss the occurrence of cracks in any given turbine as related to history of secondary water chemistry in the unit:

Unit 3 does not have the capability to perform chemical analyses at the LP turbine. However, FP&L, in conjunction with Westinghouse, is conducting testing on both Turkey Point Units 3 and 4 to determine several parameters (pH, conductivity, and others) of the steam entering the LP turbines. We can provide, at your request, the results of this testing when the results become available. Nominal water chemistry philosophy and a record of condenser inleakages are, however, included in our response as Appendix C. We have been unable to identify to date any correlation between turbine disc cracking of any type and secondary chemistry. In point of fact recent industry research indicates that disc cracking may be independent of secondary water chemistry, that is cracking may occur even in a pure steam environment.

IV. <u>If your plant has not been inspected, describe your proposed schedule and approach to ensure that turbine cracking does not exist in your turbine</u>:

It is presently impossible to ensure that cracking does not exist in the Unit 3 LP rotor discs as cracking has been empirically proven to exist in some operating LP rotor discs. However, we can state that the rotors were crack-free when installed in the Unit 3 turbine. Current analyses show (see items I.D.4. and I.D.5.) that the maximum expected crack size at any time in a rotor's operating life can be calculated and inspections scheduled accordingly as discussed in Section I.B. For the most limiting LP disc (LP 2 disc 2 governor end), over 73,000 hours of operation are required for the calculated crack size to approach the calculated critical crack size, and therefore the next inspection would be scheduled based on the 5 year operating criteria. Additionally, we believe the method used in this response to calculate the crack growth rate is significantly more conservative than that currently used by the NRC. Also, the Unit 3 LP rotors incorporate new features (see our letter dated January 23, 1980) designed to preclude cracking. It should be noted that these features do not exist on those units which comprise the current data base on which the existing inspection criteria are based.

V. <u>If your plant has been inspected and plans to return or has returned to power with cracks, provide your proposed schedule for the next turbine inspection and the basis for this inspection schedule</u>:

This question is not applicable to Turkey Point Unit 4.

VI. <u>Indicate whether an analysis and evaluation regarding turbine missiles have been performed for your plant and provided to the staff. If such an analysis and evaluation has been performed and reported, please provide appropriate references to the available documentation</u>:

This information is included as Appendix D.

APPENDIX A

WESTINGHOUSE PROPRIETARY

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ID # : D081102701

                              LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION              B. MATERIAL PROPERTIES (HUB)                      C. MATERIAL PROPERTIES (RIM)
 1. BUILDING BLOCK          81        1. TYPE                  b,c,e TD
                                         (MIN. Y.S.   [110.0 ](KSI))
 2. UNIT        TURKEY PT. #3         2. SUPPLIER:
 3. CUSTOMER:   FLORIDA P&L           3. Y.S. (KSI)               [124.000] b,c,e  1. Y.S. (KSI)              [124.000] b,c,e
 4. LP#                      1        4. U.T.S. (KSI)             [138.000]        2. U.T.S. (KSI)            [138.000]
 5. LOCATION               GOV        5. ELONGATION               [  21.0 ]        3. ELONGATION              [  21.2 ]
 6. DISC#                    1        6. R.A.                     [  66.2 ]        4. R.A.                    [  66.2 ]
 7. TEST NO.     TD35155              7. FATT (DEG.F)             [-105.0 ]        5. FATT (DEG.F)            [-105.0 ]
                                      8. R.T. IMPACT(FT.LB.)      [  82.0 ]        6. R.T. IMPACT(FT.LB.)     [  76.5 ]
                                      9. U.S. IMPACT TEMP.        [  75.0 ]        7. U.S. IMPACT TEMP.       [   0.0 ]
                                              (DEG.F)                                      (DEG.F)
                                     10. U.S. IMPACT ENG.         [  82.0 ]        8. U.S. IMPACT ENG.        [  76.5 ]
                                              (FT.LB.)                                     (FT.LB.)
                                     11. U.S. KIC                 [ 216.79]        9. U.S. KIC                [ 208.77]
                                              (KSI*SQRT(IN.))                              (KSI*SQRT(IN.))

D. CHEMISTRY
             C              MN              SI             P               CR              MO              V
          [ .26 ]b,c,e   [ .29 ]b,c,e   [ .03 ]b,c,e   [ .008 ]b,c,e   [ 1.65 ]b,c,e   [ .38 ]b,c,e   [ .13 ]b,c,e

             NI             AS              SB             SN              AL              CU              S
          [ 3.50 ]b,c,e  [ -  ]b,c,e    [ -  ]b,c,e    [ -  ]b,c,e     [ -  ]b,c,e     [ -  ]b,c,e    [ .010 ]b,c,e

E. BORE STRESS                                           F. CRACK DATA
     SPEED (RPM)     STRESS

  1. 1800            (KSI)    [62.700] b,c,e               1. A-CR-OP (1800 RPM) (IN.)      [3.87] b,c,e
  2. 2160 (120%)     (KSI)    [71.000]                     2. A-CR-OS (OVERSPEED) (IN.)     [2.93]

G. SERVICE DATA

  1. OPER. TEMP. METAL TEMP. HUB (DEG.F)    [      388] b,c,e
  2. ESTIMATED MAX DA/DT (IN/HR)            [ .828-004]
```

WESTINGHOUSE PROPRIETARY

ID # : D081102701

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION

1. BUILDING BLOCK 81
2. UNIT TURKEY PT. #3
3. CUSTOMER: FLORIDA P&L
4. LP# 1
5. LOCATION GOV
6. DISC# 2
7. TEST NO. TD23413

B. MATERIAL PROPERTIES (HUB)

1. TYPE [b,c,e TD
(MIN. Y.S. [110.0] (KSI))
2. SUPPLIER:

3. Y.S. (KSI)	[110.500	]b,c,e
4. U.T.S. (KSI)	127.000	
5. ELONGATION	22.3	
6. R.A.	65.0	
7. FATT (DEG.F)	-120.0	
8. R.T. IMPACT(FT.LB.)	78.5	
9. U.S. IMPACT TEMP. (DEG.F)	75.0	
10. U.S. IMPACT ENG. (FT.LB.)	78.5	
11. U.S. KIC (KSI*SQRT(IN.))	200.80	

C. MATERIAL PROPERTIES (RIM)

1. Y.S. (KSI)	[116.000	]b,c,e
2. U.T.S. (KSI)	129.000	
3. ELONGATION	21.6	
4. R.A.	67.0	
5. FATT (DEG.F)	-120.0	
6. R.T. IMPACT(FT.LB.)	80.5	
7. U.S. IMPACT TEMP. (DEG.F)	0.0	
8. U.S. IMPACT ENG. (FT.LB.)	80.5	
9. U.S. KIC (KSI*SQRT(IN.))	208.15	

D. CHEMISTRY

C	MN	SI	P	CR	MO	V
[.25]b,c,e	[.27]b,c,e	[.02]b,c,e	[.008]b,c,e	[1.68]b,c,e	[.40]b,c,e	[.11]b,c,e

NI	AS	SB	SN	AL	CU	S
[3.56]b,c,e	[-]b,c,e	[-]b,c,e	[-]b,c,e	[-]b,c,e	[-]b,c,e	[.013]b,c,e

E. BORE STRESS

SPEED (RPM)		STRESS	
1. 1800	(KSI)	[61.500	]b,c,e
2. 2160 (120%)	(KSI)	69.800]	

F. CRACK DATA

1. A-CR-OP (1800 RPM) (IN.)	[3.41	]b,c,e
2. A-CR-OS (OVERSPEED) (IN.)	2.56]	

G. SERVICE DATA

1. OPER. TEMP. METAL TEMP. HUB (DEG.F)	[304	]b,c,e
2. ESTIMATED MAX DA/DT (IN/HR)	.220-004]	

WESTINGHOUSE PROPRIETARY

```
ID # : D08110270l

                              LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION                B. MATERIAL PROPERTIES (HUB)                        C. MATERIAL PROPERTIES (RIM)
 1. BUILDING BLOCK          81           1. TYPE
                                            (MIN. Y.S. [100.0]b,c,e TC (KSI))
 2. UNIT       TURKEY PT. #3             2. SUPPLIER:   UNITED STATES STEEL ]b,c,e
 3. CUSTOMER:  FLORIDA P&L               3. Y.S. (KSI)               [105.600      1. Y.S. (KSI)                [103.900 ]b,c,e
 4. LP#                      1           4. U.T.S. (KSI)              123.300      2. U.T.S. (KSI)               121.800
 5. LOCATION               GOV           5. ELONGATION                 22.0       3. ELONGATION                   22.0
 6. DISC#                    3           6. R.A.                       67.0       4. R.A.                         69.0
 7. TEST NO.     TN11424                 7. FATT (DEG.F)             -100.0       5. FATT (DEG.F)               -100.0
                                         8. R.T. IMPACT(FT.LB.)       102.0       6. R.T. IMPACT(FT.LB.)         102.0
                                         9. U.S. IMPACT TEMP.         -50.0       7. U.S. IMPACT TEMP.           -50.0
                                              (DEG.F)                                   (DEG.F)
                                        10. U.S. IMPACT ENG.           78.0       8. U.S. IMPACT ENG.             78.0
                                              (FT.LB.)                                  (FT.LB.)
                                        11. U.S. KIC                 195.95]      9. U.S. KIC                   194.48]
                                              (KSI*SQRT(IN.))                           (KSI*SQRT(IN.))

D. CHEMISTRY
          C           MN           SI            P              CR          MO          V
       [ .29 ]b,c,e [ .30 ]b,c,e [ .08 ]b,c,e [ .008 ]b,c,e [ 1.80 ]b,c,e [ .44 ]b,c,e [ .14 ]b,c,e

          NI          AS           SB            SN             AL          CU          S
       [ 3.40 ]b,c,e [ .007 ]b,c,e [ .0008 ]b,c,e [ .001 ]b,c,e [ .003 ]b,c,e [ .05 ]b,c,e [ .008 ]b,c,e

E. BORE STRESS                                            F. CRACK DATA
    SPEED (RPM)     STRESS

  1. 1800           (KSI)     [ 70.600 ]b,c,e               1. A-CR-OP (1800 RPM) (IN.)          [ 2.36 ]b,c,e
  2. 2160 (120%)    (KSI)     [ 81.600 ]                    2. A-CR-OS (OVERSPEED) (IN.)         [ 1.67 ]

G. SERVICE DATA

  1. OPER. TEMP. METAL TEMP. HUB (DEG.F)   [      250 ]b,c,e
  2. ESTIMATED MAX DA/DT (IN/HR)           [ .794-005 ]
```

ID # : D081102701

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION

1. BUILDING BLOCK		81
2. UNIT	TURKEY PT. #3	
3. CUSTOMER:	FLORIDA P&L	
4. LP#		1
5. LOCATION		GOV
6. DISC#		4
7. TEST NO.	TD23449	

B. MATERIAL PROPERTIES (HUB)

1. TYPE (MIN. Y.S. [120.0]b,c,e ~~110.0~~ (KSI)) TO TE
2. SUPPLIER:

3. Y.S. (KSI)	119.000
4. U.T.S. (KSI)	134.500
5. ELONGATION	21.2
6. R.A.	67.0
7. FATT (DEG.F)	-105.0
8. R.T. IMPACT(FT.LB.)	69.0
9. U.S. IMPACT TEMP. (DEG.F)	75.0
10. U.S. IMPACT ENG. (FT.LB.)	69.0
11. U.S. KIC (KSI*SQRT(IN.))	193.69

b,c,e

C. MATERIAL PROPERTIES (RIM)

1. Y.S. (KSI)	116.500
2. U.T.S. (KSI)	132.500
3. ELONGATION	22.4
4. R.A.	68.5
5. FATT (DEG.F)	-105.0
6. R.T. IMPACT(FT.LB.)	84.0
7. U.S. IMPACT TEMP. (DEG.F)	0.0
8. U.S. IMPACT ENG. (FT.LB.)	84.0
9. U.S. KIC (KSI*SQRT(IN.))	213.39

b,c,e

D. CHEMISTRY

C	MN	SI	P	CR	MO	V
[.28]b,c,e	[.32]b,c,e	[.28]b,c,e	[.009]b,c,e	[1.68]b,c,e	[.36]b,c,e	[.13]b,c,e

NI	AS	SB	SN	AL	CU	S
[-]b,c,e	[-]b,c,e	[-]b,c,e	[-]b,c,e	[-]b,c,e	[-]b,c,e	[.007]b,c,e

E. BORE STRESS

SPEED (RPM)		STRESS
1. 1800	(KSI)	61.300
2. 2160 (120%)	(KSI)	71.400

b,c,e

F. CRACK DATA

1. A-CR-OP (1800 RPM) (IN.)	3.17
2. A-CR-OS (OVERSPEED) (IN.)	2.23

b,c,e

G. SERVICE DATA

1. OPER. TEMP. METAL TEMP. HUB (DEG.F)	205
2. ESTIMATED MAX DA/DT (IN/HR)	.299-005

b,c,e

WESTINGHOUSE PROPRIETARY

ID # : D081102701

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION

1.	BUILDING BLOCK	81
2.	UNIT	TURKEY PT. #3
3.	CUSTOMER:	FLORIDA P&L
4.	LP#	1
5.	LOCATION	GOV
6.	DISC#	5
7.	TEST NO.	TD14985

B. MATERIAL PROPERTIES (HUB)

1. TYPE [110.0] b,c,e ~~TE~~ TD
(MIN. Y.S. ~~120.0~~ (KSI))
2. SUPPLIER:

3.	Y.S. (KSI)	[128.500
4.	U.T.S. (KSI)	145.000
5.	ELONGATION	19.0
6.	R.A.	62.8
7.	FATT (DEG.F)	-98.0
8.	R.T. IMPACT(FT.LB.)	61.5
9.	U.S. IMPACT TEMP. (DEG.F)	75.0
10.	U.S. IMPACT ENG. (FT.LB.)	61.5
11.	U.S. KIC (KSI.SQRT(IN.))	188.11] b,c,e

C. MATERIAL PROPERTIES (RIM)

1.	Y.S. (KSI)	[106.500
2.	U.T.S. (KSI)	124.000
3.	ELONGATION	23.0
4.	R.A.	70.5
5.	FATT (DEG.F)	-98.0
6.	R.T. IMPACT(FT.LB.)	84.0
7.	U.S. IMPACT TEMP. (DEG.F)	75.0
8.	U.S. IMPACT ENG. (FT.LB.)	84.0
9.	U.S. KIC (KSI.SQRT(IN.))	204.68] b,c,e

D. CHEMISTRY

C	MN	SI	P	CR	MO	V
[.25] b,c,e	[.34] b,c,e	[.22] b,c,e	[.008] b,c,e	[1.67] b,c,e	[.46] b,c,e	[.12] b,c,e

NI	AS	SB	SN	AL	CU	S
[3.37] b,c,e	[-] b,c,e	[-] b,c,e	[-] b,c,e	[-] b,c,e	[-] b,c,e	[.009] b,c,e

E. BORE STRESS

SPEED (RPM)	STRESS	
1. 1800	(KSI)	[63.000
2. 2160 (120%)	(KSI)	72.900] b,c,e

F. CRACK DATA

1.	A-CR-OP (1800 RPM) (IN.)	[2.79
2.	A-CR-OS (OVERSPEED) (IN.)	1.98] b,c,e

G. SERVICE DATA

1.	OPER. TEMP. METAL TEMP. HUB (DEG.F)	[180
2.	ESTIMATED MAX DA/DT (IN/HR)	.164-005] b,c,e

WESTINGHOUSE PROPRIETARY

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ID # : D081102701

                         LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION              B. MATERIAL PROPERTIES (HUB)                       C. MATERIAL PROPERTIES (RIM)
 1. BUILDING BLOCK           81        1. TYPE                   [120.0] b,c,e TO TE
                                          (MIN. Y.S.              (KSI))
 2. UNIT        TURKEY PT. #3          2. SUPPLIER:   MIDVALE HEPPENSTALL
 3. CUSTOMER:   FLORIDA P&L            3. Y.S. (KSI)                  [124.000] b,c,e   1. Y.S. (KSI)                [124.500] b,c,e
 4. LP#                       1        4. U.T.S. (KSI)                 137.500          2. U.T.S. (KSI)               139.000
 5. LOCATION                GOV        5. ELONGATION                     21.8           3. ELONGATION                   22.2
 6. DISC#                     6        6. R.A.                           66.8           4. R.A.                         66.6
 7. TEST NO.     TD24061               7. FATT (DEG.F)                 -120.0           5. FATT (DEG.F)               -120.0
                                       8. R.T. IMPACT(FT.LB.)            78.5           6. R.T. IMPACT(FT.LB.)          76.5
                                       9. U.S. IMPACT TEMP.              75.0           7. U.S. IMPACT TEMP.             0.0
                                               (DEG.F)                                          (DEG.F)
                                      10. U.S. IMPACT ENG.               78.5           8. U.S. IMPACT ENG.             76.5
                                               (FT.LB.)                                         (FT.LB.)
                                      11. U.S. KIC                      211.72]         9. U.S. KIC                   209.16]
                                               (KSI*SQRT(IN.))                                  (KSI*SQRT(IN.))

D. CHEMISTRY
          C        MN        SI        P         CR        MO        V
       [ .24 ]b,c,e [ .31 ]b,c,e [ .03 ]b,c,e [ .008 ]b,c,e [ 1.67 ]b,c,e [ .44 ]b,c,e [ .13 ]b,c,e
          NI       AS        SB        SN        AL        CU        S
       [ 3.43 ]b,c,e [ - ]b,c,e [ .0013 ]b,c,e [ - ]b,c,e [ - ]b,c,e [ - ]b,c,e [ .007 ]b,c,e

E. BORE STRESS                                              F. CRACK DATA
     SPEED (RPM)     STRESS

 1. 1800            (KSI)     [ 55.500 ]b,c,e               1. A-CR-OP (1800 RPM) (IN.)      [ 4.79 ]b,c,e
 2. 2160 (120%)     (KSI)     [ 65.400 ]                    2. A-CR-OS (OVERSPEED) (IN.)     [ 3.34 ]

G. SERVICE DATA

 1. OPER. TEMP. METAL TEMP. HUB (DEG.F)   [     191 ]b,c,e
 2. ESTIMATED MAX DA/DT (IN/HR)           [ .215-005 ]
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WESTINGHOUSE PROPRIETARY

ID # : D081102702

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION

1. BUILDING BLOCK		81
2. UNIT	TURKEY PT. #3	
3. CUSTOMER:	FLORIDA P&L	
4. LP#		1
5. LOCATION		GEN
6. DISC#		1
7. TEST NO.	TD35156	

B. MATERIAL PROPERTIES (HUB)

1. TYPE TD
(MIN. Y.S. [110.0]b,c,e (KSI))
2. SUPPLIER:

3. Y.S. (KSI)	[121.000
4. U.T.S. (KSI)	134.000
5. ELONGATION	21.8
6. R.A.	65.6
7. FATT (DEG.F)	-120.0
8. R.T. IMPACT(FT.LB.)	86.0
9. U.S. IMPACT TEMP. (DEG.F)	75.0
10. U.S. IMPACT ENG. (FT.LB.)	86.0
11. U.S. KIC (KSI.SQRT(IN.))	219.93]b,c,e

C. MATERIAL PROPERTIES (RIM)

1. Y.S. (KSI)	[110.000
2. U.T.S. (KSI)	124.500
3. ELONGATION	21.8
4. R.A.	65.6
5. FATT (DEG.F)	-120.0
6. R.T. IMPACT(FT.LB.)	96.0
7. U.S. IMPACT TEMP. (DEG.F)	0.0
8. U.S. IMPACT ENG. (FT.LB.)	96.0
9. U.S. KIC (KSI.SQRT(IN.))	223.10]b,c,e

D. CHEMISTRY

C	MN	SI	P	CR	MO	V
[.27]b,c,e	[.33]b,c,e	[.02]b,c,e	[.008]b,c,e	[1.65]b,c,e	[.35]b,c,e	[.12]b,c,e

NI	AS	SB	SN	AL	CU	S
[3.52]b,c,e	[-]b,c,e	[-]b,c,e	[-]b,c,e	[-]b,c,e	[-]b,c,e	[.009]b,c,e

E. BORE STRESS

SPEED (RPM)	STRESS	
1. 1800	(KSI)	[62.700
2. 2160 (120%)	(KSI)	71.000]b,c,e

F. CRACK DATA

1. A-CR-OP (1800 RPM) (IN.) [3.99
2. A-CR-OS (OVERSPEED) (IN.) 3.03]b,c,e

G. SERVICE DATA

1. OPER. TEMP. METAL TEMP. HUB (DEG.F) [388
2. ESTIMATED MAX DA/DT (IN/HR) .828-004]b,c,e

WESTINGHOUSE PROPRIETARY

ID # : D081102702

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION
1. BUILDING BLOCK B1
2. UNIT TURKEY PT. #3
3. CUSTOMER: FLORIDA P&L
4. LP# 1
5. LOCATION GEN
6. DISC# 2
7. TEST NO. TD35157

B. MATERIAL PROPERTIES (HUB)
1. TYPE TD
(MIN. Y.S. [110.0]b,c,e (KSI))
2. SUPPLIER:

3. Y.S. (KSI)	[119.000
4. U.T.S. (KSI)	133.000
5. ELONGATION	22.0
6. R.A.	67.5
7. FATT (DEG.F)	-120.0
8. R.T. IMPACT(FT.LB.)	92.0
9. U.S. IMPACT TEMP. (DEG.F)	75.0
10. U.S. IMPACT ENG. (FT.LB.)	92.0
11. U.S. KIC (KSI*SQRT(IN.))	226.27]b,c,e

C. MATERIAL PROPERTIES (RIM)

1. Y.S. (KSI)	[124.500
2. U.T.S. (KSI)	137.000
3. ELONGATION	21.9
4. R.A.	67.9
5. FATT (DEG.F)	-120.0
6. R.T. IMPACT(FT.LB.)	92.0
7. U.S. IMPACT TEMP. (DEG.F)	50.0
8. U.S. IMPACT ENG. (FT.LB.)	92.0
9. U.S. KIC (KSI*SQRT(IN.))	231.07]b,c,e

D. CHEMISTRY

C	MN	SI	P	CR	MO	V
[.26]b,c,e	[.28]b,c,e	[.01]b,c,e	[.006]b,c,e	[1.71]b,c,e	[.33]b,c,e	[.14]b,c,e

NI	AS	SB	SN	AL	CU	S
[3.46]b,c,e	[-]b,c,e	[.0014]b,c,e	[.015]b,c,e	[-]b,c,e	[-]b,c,e	[.007]b,c,e

E. BORE STRESS

SPEED (RPM)	STRESS	
1. 1800	(KSI)	[61.500
2. 2160 (120%)	(KSI)	69.800]b,c,e

F. CRACK DATA
1. A-CR-OP (1800 RPM) (IN.) [4.43
2. A-CR-OS (OVERSPEED) (IN.) 3.35]b,c,e

G. SERVICE DATA
1. OPER. TEMP. METAL TEMP. HUB (DEG.F) [304
2. ESTIMATED MAX DA/DT (IN/HR) .220-004]b,c,e

WESTINGHOUSE PROPRIETARY

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ID # : 0081102702

                              LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION            B. MATERIAL PROPERTIES (HUB)                              C. MATERIAL PROPERTIES (RIM)
 1. BUILDING BLOCK        81         1. TYPE
                                        (MIN. Y.S.   [100.0]b,c,e ]c
 2. UNIT        TURKEY PT. #3                        (KSI))
 3. CUSTOMER:   FLORIDA P&L          2. SUPPLIER:    UNITED STATES STEEL  b,c,e
 4. LP#                    1         3. Y.S. (KSI)                  [102.800]    1. Y.S. (KSI)                 [108.300] b,c,e
 5. LOCATION             GEN         4. U.T.S. (KSI)                [120.800]    2. U.T.S. (KSI)               [126.300]
 6. DISC#                  3         5. ELONGATION                  [  23.0 ]    3. ELONGATION                 [  21.0 ]
 7. TEST NO.     TN11425             6. R.A.                        [  69.0 ]    4. R.A.                       [  66.0 ]
                                     7. FATT (DEG.F)                [-100.0 ]    5. FATT (DEG.F)               [-100.0 ]
                                     8. R.T. IMPACT(FT.LB.)         [  91.0 ]    6. R.T. IMPACT(FT.LB.)        [  91.0 ]
                                     9. U.S. IMPACT TEMP.           [ -50.0 ]    7. U.S. IMPACT TEMP.          [ -50.0 ]
                                            (DEG.F)                                      (DEG.F)
                                    10. U.S. IMPACT ENG.            [  80.0 ]    8. U.S. IMPACT ENG.           [  80.0 ]
                                            (FT.LB.)                                     (FT.LB.)
                                    11. U.S. KIC                    [ 196.16]    9. U.S. KIC                   [ 200.97]
                                            (KSI*SQRT(IN.))                              (KSI*SQRT(IN.))

D. CHEMISTRY
         C               MN              SI              P               CR              MO              V
       [.29 ]b,c,e     [ .30 ]b,c,e    [ .08 ]b,c,e    [ .008 ]b,c,e   [ 1.80 ]b,c,e   [ .44 ]b,c,e    [ .14 ]b,c,e

         NI              AS              SB              SN              AL              CU              S
       [3.40 ]b,c,e    [ .007 ]b,c,e   [ .0008 ]b,c,e  [ .001 ]b,c,e   [ .003 ]b,c,e   [ .05 ]b,c,e    [ .008 ]b,c,e

E. BORE STRESS                                                   F. CRACK DATA
    SPEED (RPM)       STRESS

 1. 1800            (KSI)     [ 70.600 ]b,c,e                     1. A-CR-OP (1800 RPM) (IN.)          [2.36 ]b,c,e
 2. 2160 (120%)     (KSI)     [ 81.600 ]                          2. A-CR-OS (OVERSPEED) (IN.)         [1.67 ]

G. SERVICE DATA

 1. OPER. TEMP. METAL TEMP. HUB (DEG.F)   [       250 ]b,c,e
 2. ESTIMATED MAX DA/DT (IN/HR)           [ .794-005  ]
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WESTINGHOUSE PROPRIETARY

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ID # : D081102702

                                        LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION                        B. MATERIAL PROPERTIES (HUB)                        C. MATERIAL PROPERTIES (RIM)
 1. BUILDING BLOCK           81                  1. TYPE                      b,c,e TD
                                                    (MIN. Y.S.  [110.0] (KSI))
 2. UNIT          TURKEY PT. #3                  2. SUPPLIER:
 3. CUSTOMER:     FLORIDA P&L                    3. Y.S. (KSI)              [116.000 ]b,c,e  1. Y.S. (KSI)               [118.000 ]b,c,e
 4. LP#                       1                  4. U.T.S. (KSI)             134.000          2. U.T.S. (KSI)             135.000
 5. LOCATION                GEN                  5. ELONGATION                  21.8          3. ELONGATION                  22.8
 6. DISC#                     4                  6. R.A.                        68.8          4. R.A.                        67.0
 7. TEST NO.       TD23450                       7. FATT (DEG.F)              -105.0          5. FATT (DEG.F)              -105.0
                                                 8. R.T. IMPACT(FT.LB.)         86.0          6. R.T. IMPACT(FT.LB.)         88.0
                                                 9. U.S. IMPACT TEMP.           75.0          7. U.S. IMPACT TEMP.            0.0
                                                      (DEG.F)                                      (DEG.F)
                                                10. U.S. IMPACT ENG.            86.0          8. U.S. IMPACT ENG.            88.0
                                                      (FT.LB.)                                     (FT.LB.)
                                                11. U.S. KIC                  215.68          9. U.S. KIC                  220.09
                                                      (KSI.SQRT(IN.))        ]                     (KSI.SQRT(IN.))        ]

D. CHEMISTRY
          C            MN            SI            P              CR            MO            V
       [ .27 ]b,c,e  [ .28 ]b,c,e  [ .22 ]b,c,e  [ .009 ]b,c,e  [ 1.69 ]b,c,e  [ .42 ]b,c,e  [ .12 ]b,c,e

          NI           AS            SB            SN             AL            CU            S
       [ 3.42 ]b,c,e [ - ]b,c,e    [ - ]b,c,e    [ - ]b,c,e     [ - ]b,c,e    [ - ]b,c,e    [ .007 ]b,c,e

E. BORE STRESS                                                  F. CRACK DATA
     SPEED (RPM)    STRESS

   1. 1800          (KSI)    [61.300]b,c,e                        1. A-CR-OP (1800 RPM) (IN.)      [4.02]b,c,e
   2. 2160 (120%)   (KSI)    [71.400]                             2. A-CR-OS (OVERSPEED) (IN.)     [2.86]

G. SERVICE DATA

   1. OPER. TEMP. METAL TEMP. HUB (DEG.F)   [     205]b,c,e
   2. ESTIMATED MAX DA/DT (IN/HR)           [.299-005]
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WESTINGHOUSE PROPRIETARY

ID # : D081102702

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION

1.	BUILDING BLOCK	81
2.	UNIT	TURKEY PT. #3
3.	CUSTOMER:	FLORIDA P&L
4.	LP#	1
5.	LOCATION	GEN
6.	DISC#	5
7.	TEST NO.	TD35391

B. MATERIAL PROPERTIES (HUB)

1. TYPE VT
(MIN. Y.S. [120.0]b,c,e (KSI))
2. SUPPLIER:

		[ ]b,c,e
3.	Y.S. (KSI)	122.000
4.	U.T.S. (KSI)	132.500
5.	ELONGATION	20.6
6.	R.A.	60.4
7.	FATT (DEG.F)	-110.0
8.	R.T. IMPACT(FT.LB.)	78.5
9.	U.S. IMPACT TEMP. (DEG.F)	75.0
10.	U.S. IMPACT ENG. (FT.LB.)	78.5
11.	U.S. KIC (KSI.SQRT(IN.))	210.15

C. MATERIAL PROPERTIES (RIM)

		[ ]b,c,e
1.	Y.S. (KSI)	102.000
2.	U.T.S. (KSI)	118.500
3.	ELONGATION	24.2
4.	R.A.	70.9
5.	FATT (DEG.F)	-120.0
6.	R.T. IMPACT(FT.LB.)	104.0
7.	U.S. IMPACT TEMP. (DEG.F)	75.0
8.	U.S. IMPACT ENG. (FT.LB.)	104.0
9.	U.S. KIC (KSI.SQRT(IN.))	224.59

D. CHEMISTRY

C	MN	SI	P	CR	MO	V
[.27]b,c,e	[.27]b,c,e	[.01]b,c,e	[.008]b,c,e	[1.88]b,c,e	[.31]b,c,e	[.12]b,c,e

NI	AS	SB	SN	AL	CU	S
[3.37]b,c,e	[-]b,c,e	[-]b,c,e	[-]b,c,e	[-]b,c,e	[-]b,c,e	[.007]b,c,e

E. BORE STRESS

	SPEED (RPM)	STRESS	[ ]b,c,e
1.	1800	(KSI)	63.000
2.	2160 (120%)	(KSI)	72.900

F. CRACK DATA

		[ ]b,c,e
1.	A-CR-OP (1800 RPM) (IN.)	3.57
2.	A-CR-OS (OVERSPEED) (IN.)	2.57

G. SERVICE DATA

		[ ]b,c,e
1.	OPER. TEMP. METAL TEMP. HUB (DEG.F)	180
2.	ESTIMATED MAX DA/DT (IN/HR)	.164-005

WESTINGHOUSE PROPRIETARY

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ID # : 0081102703

                              LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION              B. MATERIAL PROPERTIES (HUB)                          C. MATERIAL PROPERTIES (RIM)
 1. BUILDING BLOCK        81           1. TYPE                      b,c,e  TD
                                          (MIN. Y.S.   [110.0]  (KSI))
 2. UNIT          TURKEY PT. #3        2. SUPPLIER:                                b,c,e                               b,c,e
 3. CUSTOMER:     FLORIDA P&L          3. Y.S. (KSI)                 [ 112.000        1. Y.S. (KSI)            [ 107.000
 4. LP#                    2           4. U.T.S. (KSI)                 127.500        2. U.T.S. (KSI)            123.500
 5. LOCATION             GOV           5. ELONGATION                      21.6        3. ELONGATION                 22.6
 6. DISC#                  1           6. R.A.                            69.9        4. R.A.                       69.3
 7. TEST NO.      TD26056              7. FATT (DEG.F)                   -85.0        5. FATT (DEG.F)              -85.0
                                       8. R.T. IMPACT(FT.LB.)             67.0        6. R.T. IMPACT(FT.LB.)        92.0
                                       9. U.S. IMPACT TEMP.               75.0        7. U.S. IMPACT TEMP.           0.0
                                              (DEG.F)                                        (DEG.F)
                                      10. U.S. IMPACT ENG.                67.0        8. U.S. IMPACT ENG.           92.0
                                              (FT.LB.)                                       (FT.LB.)
                                      11. U.S. KIC                      185.43 ]      9. U.S. KIC                 215.31 ]
                                              (KSI.SQRT(IN.))                                (KSI.SQRT(IN.))

D. CHEMISTRY
        C            MN            SI             P             CR            MO            V
     [ .25 ]b,c,e  [ .30 ]b,c,e  [ .030 ]b,c,e  [ .012 ]b,c,e  [ 1.87 ]b,c,e  [ .39 ]b,c,e  [ .12 ]b,c,e

        NI           AS            SB             SN            AL            CU            S
     [ 3.48 ]b,c,e [ - ]b,c,e    [ .0016 ]b,c,e [ - ]b,c,e     [ - ]b,c,e     [ - ]b,c,e    [ .009 ]b,c,e

E. BORE STRESS                                              F. CRACK DATA
    SPEED (RPM)   STRESS

 1. 1800          (KSI)   [ 62.700 ]b,c,e                    1. A-CR-OP (1800 RPM) (IN.)        [ 2.73 ]b,c,e
 2. 2160 (120%)   (KSI)   [ 71.000 ]                         2. A-CR-OS (OVERSPEED) (IN.)       [ 2.04 ]

G. SERVICE DATA

 1. OPER. TEMP. METAL TEMP. HUB (DEG.F)       [   388   ]b,c,e
 2. ESTIMATED MAX DA/DT (IN/HR)               [ .828-004 ]
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WESTINGHOUSE PROPRIETARY

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ID # : D081102703

                                        LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION                      B. MATERIAL PROPERTIES (HUB)                       C. MATERIAL PROPERTIES (RIM)
 1. BUILDING BLOCK              81             1. TYPE                         b,c,e
                                                  (MIN. Y.S.    [120.0] (KSI))  VT
 2. UNIT          TURKEY PT. #3                2. SUPPLIER:
 3. CUSTOMER:     FLORIDA P&L                  3. Y.S. (KSI)               [122.000] b,c,e  1. Y.S. (KSI)               [107.000] b,c,e
 4. LP#                          2             4. U.T.S. (KSI)             [134.500]        2. U.T.S. (KSI)             [120.000]
 5. LOCATION                   GOV             5. ELONGATION               [  20.4 ]        3. ELONGATION               [  23.8 ]
 6. DISC#                        2             6. R.A.                     [  62.1 ]        4. R.A.                     [  71.3 ]
 7. TEST NO.      TD20819                      7. FATT (DEG.F)             [ -90.0 ]        5. FATT (DEG.F)             [-120.0 ]
                                               8. R.T. IMPACT(FT.LB.)      [  69.0 ]        6. R.T. IMPACT(FT.LB.)      [ 104.0 ]
                                               9. U.S. IMPACT TEMP.        [  75.0 ]        7. U.S. IMPACT TEMP.        [  75.0 ]
                                                     (DEG.F)                                      (DEG.F)
                                              10. U.S. IMPACT ENG.         [  69.0 ]        8. U.S. IMPACT ENG.         [ 104.0 ]
                                                     (FT.LB.)                                     (FT.LB.)
                                              11. U.S. KIC                 [ 195.88]        9. U.S. KIC                 [ 229.73]
                                                     (KSI.SQRT(IN.))                              (KSI.SQRT(IN.))

D. CHEMISTRY
            C            MN            SI            P             CR            MO            V
         [.26]b,c,e   [.27]b,c,e   [.18]b,c,e   [.009]b,c,e   [1.78]b,c,e   [.45]b,c,e   [.11]b,c,e

            NI           AS            SB            SN            AL            CU            S
         [3.65]b,c,e  [-]b,c,e     [-]b,c,e     [-]b,c,e      [-]b,c,e      [-]b,c,e     [.007]b,c,e

E. BORE STRESS                                                   F. CRACK DATA
     SPEED (RPM)      STRESS

 1. 1800             (KSI)    [61.500] b,c,e                      1. A-CR-OP (1800 RPM) (IN.)         [3.22] b,c,e
 2. 2160 (120%)      (KSI)    [69.800]                            2. A-CR-OS (OVERSPEED) (IN.)        [2.42]

G. SERVICE DATA

 1. OPER. TEMP. METAL TEMP. HUB (DEG.F)    [     304] b,c,e
 2. ESTIMATED MAX DA/DT. (IN/HR)           [.220-004]
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WESTINGHOUSE PROPRIETARY

ID # : D081102703

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION

1. BUILDING BLOCK	81
2. UNIT	TURKEY PT. #3
3. CUSTOMER:	FLORIDA P&L
4. LP#	2
5. LOCATION	GOV
6. DISC#	3
7. TEST NO.	TN11426

B. MATERIAL PROPERTIES (HUB)

1. TYPE TC
(MIN. Y.S. [100.0]b,c,e (KSI))
2. SUPPLIER: UNITED STATES STEEL

3. Y.S. (KSI)	[110.900
4. U.T.S. (KSI)	127.300
5. ELONGATION	20.0
6. R.A.	61.0
7. FATT (DEG.F)	-100.0
8. R.T. IMPACT(FT.LB.)	94.0
9. U.S. IMPACT TEMP. (DEG.F)	-50.0
10. U.S. IMPACT ENG. (FT.LB.)	67.0
11. U.S. KIC (KSI*SQRT(IN.))	184.60]b,c,e

C. MATERIAL PROPERTIES (RIM)

1. Y.S. (KSI)	[105.900
2. U.T.S. (KSI)	121.300
3. ELONGATION	22.0
4. R.A.	68.0
5. FATT (DEG.F)	-100.0
6. R.T. IMPACT(FT.LB.)	94.0
7. U.S. IMPACT TEMP. (DEG.F)	-50.0
8. U.S. IMPACT ENG. (FT.LB.)	67.0
9. U.S. KIC (KSI*SQRT(IN.))	180.76]b,c,e

D. CHEMISTRY

C	MN	SI	P	CR	MO	V
[.27]b,c,e	[.30]b,c,e	[.08]b,c,e	[.008]b,c,e	[1.80]b,c,e	[.44]b,c,e	[.14]b,c,e

NI	AS	SB	SN	AL	CU	S
[3.40]b,c,e	[.007]b,c,e	[.0008]b,c,e	[.001]b,c,e	[.003]b,c,e	[.05]b,c,e	[.008]b,c,e

E. BORE STRESS

SPEED (RPM)	STRESS	
1. 1800	(KSI)	[70.600
2. 2160 (120%)	(KSI)	81.600]b,c,e

F. CRACK DATA

1. A-CR-OP (1800 RPM) (IN.)	[2.05
2. A-CR-OS (OVERSPEED) (IN.)	1.44]b,c,e

G. SERVICE DATA

1. OPER. TEMP. METAL TEMP. HUB (DEG.F)	[250
2. ESTIMATED MAX DA/DT (IN/HR)	.794-005]b,c,e

WESTINGHOUSE PROPRIETARY

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ID # : D081102703

                                  LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION                  B. MATERIAL PROPERTIES (HUB)       TE     C. MATERIAL PROPERTIES (RIM)
 1. BUILDING BLOCK           81            1. TYPE                  b,c,e
                                              (MIN. Y.S.   [120.0] (KSI))
 2. UNIT          TURKEY PT. #3            2. SUPPLIER:
 3. CUSTOMER:     FLORIDA P&L              3. Y.S. (KSI)              [131.000 ]b,c,e  1. Y.S. (KSI)              [110.500 ]b,c,e
 4. LP#                      2             4. U.T.S. (KSI)            [147.000 ]       2. U.T.S. (KSI)            [127.500 ]
 5. LOCATION               GOV             5. ELONGATION              [   18.8 ]       3. ELONGATION              [   22.2 ]
 6. DISC#                    4             6. R.A.                    [   63.1 ]       4. R.A.                    [   66.2 ]
 7. TEST NO.      TD14982                  7. FATT (DEG.F)            [  -70.0 ]       5. FATT (DEG.F)            [ -120.0 ]
                                           8. R.T. IMPACT(FT.LB.)     [   65.0 ]       6. R.T. IMPACT(FT.LB.)     [  100.0 ]
                                           9. U.S. IMPACT TEMP.       [   75.0 ]       7. U.S. IMPACT TEMP.       [   75.0 ]
                                                  (DEG.F)                                      (DEG.F)
                                          10. U.S. IMPACT ENG.        [   65.0 ]       8. U.S. IMPACT ENG.        [  100.0 ]
                                                  (FT.LB.)                                     (FT.LB.)
                                          11. U.S. KIC                [ 195.66 ]       9. U.S. KIC                [ 228.47 ]
                                                  (KSI.SQRT(IN.))                              (KSI.SQRT(IN.))

D. CHEMISTRY
          C             MN            SI            P              CR            MO            V
        [ .25 ]b,c,e  [ .30 ]b,c,e  [ .26 ]b,c,e  [ .009 ]b,c,e  [ 1.60 ]b,c,e  [ .46 ]b,c,e  [ .12 ]b,c,e

          NI            AS            SB            SN             AL            CU            S
        [ 3.63 ]b,c,e [ - ]b,c,e    [ - ]b,c,e    [ - ]b,c,e     [ - ]b,c,e    [ - ]b,c,e    [ .008 ]b,c,e

E. BORE STRESS                                              F. CRACK DATA
     SPEED (RPM)    STRESS

  1. 1800           (KSI)   [ 61.300 ]b,c,e                   1. A-CR-OP (1800 RPM) (IN.)       [ 3.24 ]b,c,e
  2. 2160 (120%)    (KSI)   [ 71.400 ]                        2. A-CR-OS (OVERSPEED) (IN.)      [ 2.29 ]

G. SERVICE DATA

  1. OPER. TEMP. METAL TEMP. HUB (DEG.F)  [       205 ]b,c,e
  2. ESTIMATED MAX DA/DT (IN/HR)          [ .299-005  ]
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WESTINGHOUSE PROPRIETARY

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ID # : 0081102703

                                   LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION                 B. MATERIAL PROPERTIES (HUB)                   C. MATERIAL PROPERTIES (RIM)
 1. BUILDING BLOCK          81            1. TYPE                 b,c,e  TD
                                             (MIN. Y.S.   [110.0 ] (KSI))
 2. UNIT        TURKEY PT. #3             2. SUPPLIER:
 3. CUSTOMER:   FLORIDA P&L               3. Y.S. (KSI)               [116.000 ]b,c,e 1. Y.S. (KSI)                [121.500 ]b,c,e
 4. LP#                      2            4. U.T.S. (KSI)             |132.500 |      2. U.T.S. (KSI)             |133.500 |
 5. LOCATION               GOV            5. ELONGATION               |   20.3 |      3. ELONGATION               |   21.2 |
 6. DISC#                    5            6. R.A.                     |   64.3 |      4. R.A.                     |   68.5 |
 7. TEST NO.      TD23427                 7. FATT (DEG.F)             |  -65.0 |      5. FATT (DEG.F)             |  -65.0 |
                                          8. R.T. IMPACT(FT.LB.)      |   86.0 |      6. R.T. IMPACT(FT.LB.)      |   78.5 |
                                          9. U.S. IMPACT TEMP.        |   75.0 |      7. U.S. IMPACT TEMP.        |    0.0 |
                                                  (DEG.F)             |        |              (DEG.F)             |        |
                                         10. U.S. IMPACT ENG.         |   86.0 |      8. U.S. IMPACT ENG.         |   78.5 |
                                                  (FT.LB.)            |        |              (FT.LB.)            |        |
                                         11. U.S. KIC                 | 215.68 |      9. U.S. KIC                 | 209.76 |
                                                  (KSI*SQRT(IN.))     [        ]              (KSI*SQRT(IN.))     [        ]

D. CHEMISTRY
            C            MN           SI           P             CR           MO           V
          [ .27 ]b,c,e [ .28 ]b,c,e [ .22 ]b,c,e [ .009 ]b,c,e [ 1.69 ]b,c,e [ .42 ]b,c,e [ .12 ]b,c,e

            NI           AS           SB           SN            AL           CU           S
          [ 3.42 ]b,c,e [ -  ]b,c,e [ -  ]b,c,e [ -  ]b,c,e  [ -  ]b,c,e  [ -  ]b,c,e [ .007 ]b,c,e

E. BORE STRESS                                                       F. CRACK DATA
     SPEED (RPM)    STRESS

  1. 1800            (KSI)      [ 63.000 ]b,c,e                         1. A-CR-OP (1800 RPM) (IN.)         [ 3.78 ]b,c,e
  2. 2160 (120%)     (KSI)      [ 72.900 ]                              2. A-CR-OS (OVERSPEED) (IN.)        [ 2.73 ]

G. SERVICE DATA

  1. OPER. TEMP. METAL TEMP. HUB (DEG.F)    [      180 ]b,c,e
  2. ESTIMATED MAX DA/DT (IN/HR)            [ .164-005 ]
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WESTINGHOUSE PROPRIETARY

ID # : D081102703

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION

1. BUILDING BLOCK	81
2. UNIT	TURKEY PT. #3
3. CUSTOMER:	FLORIDA P&L
4. LP#	2
5. LOCATION	GOV
6. DISC#	6
7. TEST NO.	TD24058

B. MATERIAL PROPERTIES (HUB)

1. TYPE (MIN. Y.S. [110.0]b,c,e (KSI))	TD
2. SUPPLIER:	MIDVALE HEPPENSTALL
3. Y.S. (KSI)	[120.000
4. U.T.S. (KSI)	136.500
5. ELONGATION	19.4
6. R.A.	57.3
7. FATT (DEG.F)	-90.0
8. R.T. IMPACT(FT.LB.)	63.5
9. U.S. IMPACT TEMP. (DEG.F)	75.0
10. U.S. IMPACT ENG. (FT.LB.)	63.5
11. U.S. KIC (KSI.SQRT(IN.))	185.74]b,c,e

C. MATERIAL PROPERTIES (RIM)

1. Y.S. (KSI)	[125.000
2. U.T.S. (KSI)	138.500
3. ELONGATION	20.6
4. R.A.	65.2
5. FATT (DEG.F)	-90.0
6. R.T. IMPACT(FT.LB.)	60.5
7. U.S. IMPACT TEMP. (DEG.F)	0.0
8. U.S. IMPACT ENG. (FT.LB.)	60.5
9. U.S. KIC (KSI.SQRT(IN.))	184.14]b,c,e

D. CHEMISTRY

C	MN	SI	P	CR	MO	V
[.27]b,c,e	[.27]b,c,e	[.020]b,c,e	[.010]b,c,e	[1.65]b,c,e	[.43]b,c,e	[.12]b,c,e

NI	AS	SB	SN	AL	CU	S
[3.53]b,c,e	[ ]b,c,e	[ ]b,c,e	[ ]b,c,e	[ ]b,c,e	[ ]b,c,e	[.012]b,c,e

E. BORE STRESS

SPEED (RPM)	STRESS	
1. 1800	(KSI)	[55.500
2. 2160 (120%)	(KSI)	65.400]b,c,e

F. CRACK DATA

1. A-CR-OP (1800 RPM) (IN.)	[3.60
2. A-CR-OS (OVERSPEED) (IN.)	2.48]b,c,e

G. SERVICE DATA

1. OPER. TEMP. METAL TEMP. HUB (DEG.F)	[191
2. ESTIMATED MAX DA/DT (IN/HR)	.215-005]b,c,e

WESTINGHOUSE PROPRIETARY

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ID # : D081102704

                              LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION             B. MATERIAL PROPERTIES (HUB)                         C. MATERIAL PROPERTIES (RIM)
 1. BUILDING BLOCK          81        1. TYPE                         b,c,e   TD
                                         (MIN. Y.S.    [110.0 ] (KSI))
 2. UNIT         TURKEY PT. #3        2. SUPPLIER:
 3. CUSTOMER:    FLORIDA P&L          3. Y.S. (KSI)                 [116.000 ]b,c,e 1. Y.S. (KSI)                 [114.500 ]b,c,e
 4. LP#                      2        4. U.T.S. (KSI)               [130.000 ]      2. U.T.S. (KSI)               [129.000 ]
 5. LOCATION               GEN        5. ELONGATION                 [   23.2 ]      3. ELONGATION                 [   23.6 ]
 6. DISC#                    1        6. R.A.                       [   67.0 ]      4. R.A.                       [   69.3 ]
 7. TEST NO.      TD26047             7. FATT (DEG.F)               [ -115.0 ]      5. FATT (DEG.F)               [ -115.0 ]
                                      8. R.T. IMPACT(FT.LB.)        [   69.0 ]      6. R.T. IMPACT(FT.LB.)        [   86.0 ]
                                      9. U.S. IMPACT TEMP.          [   75.0 ]      7. U.S. IMPACT TEMP.          [    0.0 ]
                                               (DEG.F)              [        ]               (DEG.F)              [        ]
                                     10. U.S. IMPACT ENG.           [   69.0 ]      8. U.S. IMPACT ENG.           [   86.0 ]
                                               (FT.LB.)             [        ]               (FT.LB.)             [        ]
                                     11. U.S. KIC                   [ 191.46 ]      9. U.S. KIC                   [ 214.38 ]
                                               (KSI*SQRT(IN.))      [        ]               (KSI*SQRT(IN.))      [        ]

D. CHEMISTRY
           C          MN          SI          P            CR          MO          V
        [ .23 ]b,c,e [ .31 ]b,c,e [ .02 ]b,c,e [ .011 ]b,c,e [ 1.78 ]b,c,e [ .46 ]b,c,e [ .10 ]b,c,e

           NI         AS          SB          SN           AL          CU          S
        [ 3.37 ]b,c,e [ - ]b,c,e  [ - ]b,c,e  [ - ]b,c,e   [ - ]b,c,e  [ - ]b,c,e  [ .014 ]b,c,e

E. BORE STRESS                                                  F. CRACK DATA
     SPEED (RPM)      STRESS

  1. 1800             (KSI)    [ 62.700 ]b,c,e                   1. A-CR-OP (1800 RPM) (IN.)       [ 2.93 ]b,c,e
  2. 2160 (120%)      (KSI)    [ 71.000 ]                        2. A-CR-OS (OVERSPEED) (IN.)      [ 2.20 ]

G. SERVICE DATA

  1. OPER. TEMP. METAL TEMP. HUB (DEG.F)   [        388 ]b,c,e
  2. ESTIMATED MAX DA/DT (IN/HR)           [ .828-004   ]
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WESTINGHOUSE PROPRIETARY

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ID # : D081102704

                                        LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION                    B. MATERIAL PROPERTIES (HUB)                      C. MATERIAL PROPERTIES (RIM)
 1. BUILDING BLOCK              81           1. TYPE
                                                (MIN. Y.S.  [110.0]b,c,e (KSI))  TD
 2. UNIT        TURKEY PT. #3                2. SUPPLIER:
 3. CUSTOMER:   FLORIDA P&L                  3. Y.S. (KSI)                  [111.000]b,c,e 1. Y.S. (KSI)               [116.500]b,c,e
 4. LP#                          2           4. U.T.S. (KSI)                 124.500       2. U.T.S. (KSI)              130.000
 5. LOCATION                   GEN           5. ELONGATION                      21.7       3. ELONGATION                   22.8
 6. DISC#                        2           6. R.A.                            64.0       4. R.A.                         67.3
 7. TEST NO.      TD23414                    7. FATT (DEG.F)                  -100.0       5. FATT (DEG.F)               -100.0
                                             8. R.T. IMPACT(FT.LB.)             78.5       6. R.T. IMPACT(FT.LB.)          78.5
                                             9. U.S. IMPACT TEMP.               75.0       7. U.S. IMPACT TEMP.             0.0
                                                      (DEG.F)                                       (DEG.F)
                                            10. U.S. IMPACT ENG.                78.5       8. U.S. IMPACT ENG.             78.5
                                                      (FT.LB.)                                      (FT.LB.)
                                            11. U.S. KIC                      201.21       9. U.S. KIC                   205.75
                                                      (KSI.SQRT(IN.))                               (KSI.SQRT(IN.))

D. CHEMISTRY
          C              MN            SI             P              CR             MO            V
        [ .25 ]b,c,e  [ .27 ]b,c,e  [ .02 ]b,c,e  [ .008 ]b,c,e  [ 1.68 ]b,c,e  [ .40 ]b,c,e  [ .11 ]b,c,e

          NI             AS            SB             SN             AL             CU            S
        [ 3.56 ]b,c,e [ - ]b,c,e    [ - ]b,c,e    [ - ]b,c,e     [ - ]b,c,e     [ - ]b,c,e    [ .013 ]b,c,e

E. BORE STRESS                                                   F. CRACK DATA
     SPEED (RPM)     STRESS

 1. 1800             (KSI)     [ 61.500 ]b,c,e                     1. A-CR-OP (1800 RPM) (IN.)     [ 3.42 ]b,c,e
 2. 2160 (120%)      (KSI)     [ 69.800 ]                          2. A-CR-OS (OVERSPEED) (IN.)    [ 2.57 ]

G. SERVICE DATA

 1. OPER. TEMP. METAL TEMP. HUB (DEG.F)    [       304 ]b,c,e
 2. ESTIMATED MAX DA/DT (IN/HR)            [ .220-004  ]
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WETINGHOUSE PROPRIETARY

ID # : 0081102704

LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION

1. BUILDING BLOCK	81
2. UNIT	TURKEY PT. #3
3. CUSTOMER:	FLORIDA P&L
4. LP#	2
5. LOCATION	GEN
6. DISC#	3
7. TEST NO.	TN11427

B. MATERIAL PROPERTIES (HUB)

1. TYPE
(MIN. Y.S. [100.0]b,c,e TC (KSI))

2. SUPPLIER: UNITED STATES STEEL

	[ ]b,c,e
3. Y.S. (KSI)	109.900
4. U.T.S. (KSI)	127.300
5. ELONGATION	22.0
6. R.A.	67.0
7. FATT (DEG.F)	-100.0
8. R.T. IMPACT(FT.LB.)	99.0
9. U.S. IMPACT TEMP. (DEG.F)	-50.0
10. U.S. IMPACT ENG. (FT.LB.)	77.0
11. U.S. KIC (KSI*SQRT(IN.))	198.22

C. MATERIAL PROPERTIES (RIM)

	[ ]b,c,e
1. Y.S. (KSI)	106.400
2. U.T.S. (KSI)	123.300
3. ELONGATION	22.0
4. R.A.	70.0
5. FATT (DEG.F)	-100.0
6. R.T. IMPACT(FT.LB.)	99.0
7. U.S. IMPACT TEMP. (DEG.F)	-50.0
8. U.S. IMPACT ENG. (FT.LB.)	77.0
9. U.S. KIC (KSI*SQRT(IN.))	195.28

D. CHEMISTRY

C	MN	SI	P	CR	MO	V
[.29]b,c,e	[.30]b,c,e	[.08]b,c,e	[.008]b,c,e	[1.80]b,c,e	[.44]b,c,e	[.14]b,c,e

NI	AS	SB	SN	AL	CU	S
[3.40]b,c,e	[.007]b,c,e	[.0008]b,c,e	[.001]b,c,e	[.003]b,c,e	[.05]b,c,e	[.008]b,c,e

E. BORE STRESS

SPEED (RPM)	STRESS	[ ]b,c,e
1. 1800	(KSI)	70.600
2. 2160 (120%)	(KSI)	81.600

F. CRACK DATA

	[ ]b,c,e
1. A-CR-OP (1800 RPM) (IN.)	2.42
2. A-CR-OS (OVERSPEED) (IN.)	1.72

G. SERVICE DATA

	[ ]b,c,e
1. OPER. TEMP. METAL TEMP. HUB (DEG.F)	250
2. ESTIMATED MAX DA/DT (IN/HR)	.794-005

WESTINGHOUSE PROPRIETARY

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ID # : 0081102704

                                LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION              B. MATERIAL PROPERTIES (HUB)                     C. MATERIAL PROPERTIES (RIM)
 1. BUILDING BLOCK          81         1. TYPE
                                          (MIN. Y.S.  [110.0]b,c,e (KSI))  TD
 2. UNIT         TURKEY PT. #3         2. SUPPLIER:                        b,c,e                                b,c,e
 3. CUSTOMER:    FLORIDA P&L           3. Y.S. (KSI)               [115.500      1. Y.S. (KSI)               [122.000
 4. LP#                     2          4. U.T.S. (KSI)              131.500      2. U.T.S. (KSI)              135.000
 5. LOCATION              GEN          5. ELONGATION                   21.4      3. ELONGATION                   21.0
 6. DISC#                   4          6. R.A.                         62.3      4. R.A.                         65.4
 7. TEST NO.     TD23448               7. FATT (DEG.F)               -110.0      5. FATT (DEG.F)               -110.0
                                       8. R.T. IMPACT(FT.LB.)          69.0      6. R.T. IMPACT(FT.LB.)          63.5
                                       9. U.S. IMPACT TEMP.            75.0      7. U.S. IMPACT TEMP.             0.0
                                               (DEG.F)                                   (DEG.F)
                                      10. U.S. IMPACT ENG.             69.0      8. U.S. IMPACT ENG.             63.5
                                               (FT.LB.)                                  (FT.LB.)
                                      11. U.S. KIC                    191.08]    9. U.S. KIC                    187.12]
                                           (KSI*SQRT(IN.))                          (KSI*SQRT(IN.))

D. CHEMISTRY
       C            MN            SI            P              CR            MO            V
     [.28 ]b,c,e  [.32 ]b,c,e  [.28 ]b,c,e  [.009 ]b,c,e  [1.68 ]b,c,e  [.36 ]b,c,e  [.13 ]b,c,e

       NI           AS           SB           SN           AL           CU           S
     [3.35]b,c,e  [ - ]b,c,e   [ - ]b,c,e   [ - ]b,c,e   [ - ]b,c,e   [ - ]b,c,e   [.007 ]b,c,e

E. BORE STRESS                                               F. CRACK DATA
     SPEED (RPM)     STRESS

 1. 1800           (KSI)    [61.300]b,c,e                    1. A-CR-OP (1800 RPM) (IN.)      [3.07]b,c,e
 2. 2160 (120%)    (KSI)    [71.400]                         2. A-CR-OS (OVERSPEED) (IN.)     [2.16]

G. SERVICE DATA

 1. OPER. TEMP. METAL TEMP. HUB (DEG.F)    [     205 ]b,c,e
 2. ESTIMATED MAX DA/DT (IN/HR)            [ .299-005 ]
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WESTINGHOUSE PROPRIETARY

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ID # : D081102704

                                LP TURBINE DISC INFORMATION

A. UNIT IDENTIFICATION              B. MATERIAL PROPERTIES (HUB)                C. MATERIAL PROPERTIES (RIM)
 1. BUILDING BLOCK          81         1. TYPE                      b,c,e VS
                                          (MIN. Y.S.     [130.0]  (KSI))
 2. UNIT        TURKEY PT. #3          2. SUPPLIER:                     b,c,e                                     b,c,e
 3. CUSTOMER:   FLORIDA P&L            3. Y.S. (KSI)            [130.500]     1. Y.S. (KSI)              [115.000]
 4. LP#                      2         4. U.T.S. (KSI)          [143.500]     2. U.T.S. (KSI)            [130.000]
 5. LOCATION               GEN         5. ELONGATION            [   20.0]     3. ELONGATION              [   22.6]
 6. DISC#                    5         6. R.A.                  [   60.4]     4. R.A.                    [   65.2]
 7. TEST NO.    TD20766                7. FATT (DEG.F)          [  -10.0]     5. FATT (DEG.F)            [ -120.0]
                                       8. R.T. IMPACT(FT.LB.)   [   44.5]     6. R.T. IMPACT(FT.LB.)     [   90.0]
                                       9. U.S. IMPACT TEMP.     [   75.0]     7. U.S. IMPACT TEMP.       [   75.0]
                                             (DEG.F)                                (DEG.F)
                                      10. U.S. IMPACT ENG.      [   44.5]     8. U.S. IMPACT ENG.        [   90.0]
                                             (FT.LB.)                               (FT.LB.)
                                      11. U.S. KIC              [ 157.41]     9. U.S. KIC                [ 220.10]
                                             (KSI.SQRT.(IN.).)                      (KSI.SQRT.(IN.).)

D. CHEMISTRY
          C           MN           SI            P            CR          MO           V
        [ .29 ]b,c,e [ .31 ]b,c,e [ .25 ]b,c,e [ .009 ]b,c,e 1.85      [ .40 ]b,c,e [ .11 ]b,c,e

          NI           AS          SB           SN           AL           CU          S
        [ 3.44 ]b,c,e [ - ]b,c,e  [ - ]b,c,e   [ - ]b,c,e   [ - ]        [ - ]b,c,e  [ .007 ]b,c,e

E. BORE STRESS                                               F. CRACK DATA
     SPEED (RPM)     STRESS

  1. 1800            (KSI)     [63.000]b,c,e                  1. A-CR-OP (1800 RPM) (IN.)        [1.84]b,c,e
  2. 2160 (120%)     (KSI)     [72.900]                       2. A-CR-OS (OVERSPEED) (IN.)       [1.28]

G. SERVICE DATA

  1. OPER. TEMP. METAL TEMP. HUB (DEG.F)    [     180]b,c,e
  2. ESTIMATED MAX DA/DT (IN/HR)            [.164-005]
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WESTINGHOUSE PROPRIETARY

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: D081102704

                         LP TURBINE DISC INFORMATION

IT IDENTIFICATION                B. MATERIAL PROPERTIES (HUB)                   C. MATERIAL PROPERTIES (RIM)
UILDING BLOCK         B1            1. TYPE                              TD
                                       (MIN. Y.S.   [110.0]b,c,e (KSI))
NIT          TURKEY PT. #3          2. SUPPLIER:   MIDVALE HEPPENSTALL
USTOMER:     FLORIDA P&L            3. Y.S. (KSI)              [116.000]b,c,e  1. Y.S. (KSI)             [113.000]b,c,e
P#                     2            4. U.T.S. (KSI)             134.000        2. U.T.S. (KSI)            132.000
OCATION              GEN            5. ELONGATION                 21.0         3. ELONGATION                22.2
ISC#                   6            6. R.A.                       59.4         4. R.A.                      64.5
EST NO.      TD24057                7. FATT (DEG.F)             -120.0         5. FATT (DEG.F)            -120.0
                                    8. R.T. IMPACT(FT.LB.)        67.0         6. R.T. IMPACT(FT.LB.)       88.0
                                    9. U.S. IMPACT TEMP.          75.0         7. U.S. IMPACT TEMP.          0.0
                                          (DEG.F)                                    (DEG.F)
                                   10. U.S. IMPACT ENG.           67.0         8. U.S. IMPACT ENG.          88.0
                                          (FT.LB.)                                   (FT.LB.)
                                   11. U.S. KIC                  188.40]       9. U.S. KIC                 215.70]
                                          (KSI.SQRT(IN.))                            (KSI.SQRT(IN.))

EMISTRY
      [ C   ]b,c,e  [ MN  ]b,c,e  [ SI   ]b,c,e  [ P    ]b,c,e  [ CR   ]b,c,e  [ MO  ]b,c,e  [ V   ]b,c,e
      [ .27 ]       [ .26 ]       [ .020 ]       [ .010 ]       [ 1.65 ]       [ .43 ]       [ .12 ]

      [ NI   ]b,c,e [ AS ]b,c,e   [ SB ]b,c,e    [ SN ]b,c,e    [ AL ]b,c,e    [ CU ]b,c,e   [ S    ]b,c,e
      [ 3.36 ]      [ -  ]        [ -  ]         [ -  ]         [ -  ]         [ -  ]        [ .014 ]

RE STRESS                                               F. CRACK DATA
 SPEED (RPM)     STRESS
 1800           (KSI)      [55.500]b,c,e                   1. A-CR-OP (1800 RPM) (IN.)      [3.71]b,c,e
 2160 (120%)    (KSI)      [65.400]                        2. A-CR-OS (OVERSPEED) (IN.)     [2.57]

RVICE DATA

 OPER. TEMP. METAL TEMP. HUB (DEG.F)        [     191]b,c,e
 ESTIMATED MAX DA/DT (IN/HR)                [.215-005]
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APPENDIX B

TURKEY POINT UNIT 3
REVISED WESTINGHOUSE DATA

ROTOR	DISC	dA/dt	CALCULATED CRACK SIZE AT NEXT INSP	CRITICAL CRACK SIZE*	RATIO, A/Acr **
LP1 GOV	1	RUNS DRY b,c,e	— b,c,e	— b,c,e	— b,c,e
	2	$.330\times10^{-4}$	2.56	2.56	1.0
	3	$.119\times10^{-4}$	1.67	1.67	1.0
	4	$.449\times10^{-5}$	2.23	2.23	1.0
	5	$.246\times10^{-5}$	1.98	1.98	1.0
	6	RUNS DRY	—	—	—
LP1 GEN	1	RUNS DRY b,c,e	— b,c,e	— b,c,e	— b,c,e
	2	$.330\times10^{-4}$	3.35	3.35	1.0
	3	$.119\times10^{-4}$	1.67	1.67	1.0
	4	$.449\times10^{-5}$	2.86	2.86	1.0
	5	$.246\times10^{-5}$	2.57	2.57	1.0
	6	RUNS DRY	—	—	—
LP2 GOV	1	RUNS DRY b,c,e	— b,c,e	— b,c,e	— b,c,e
	2	$.330\times10^{-4}$	2.42	2.42	1.0
	3	$.119\times10^{-4}$	1.44	1.44	1.0
	4	$.449\times10^{-5}$	2.29	2.29	1.0
	5	$.246\times10^{-5}$	2.73	2.73	1.0
	6	RUNS DRY	—	—	—
LP2 GEN	1	RUNS DRY b,c,e	— b,c,e	— b,c,e	— b,c,e
	2	$.330\times10^{-4}$	2.57	2.57	1.0
	3	$.119\times10^{-4}$	1.72	1.72	1.0
	4	$.449\times10^{-5}$	2.16	2.16	1.0
	5	$.246\times10^{-5}$	1.28	1.28	1.0
	6	RUNS DRY	—	—	—

* AT DESIGN OVERSPEED

** BASED ON CURRENT WESTINGHOUSE CRITERIA

APPENDIX C

Turkey Point Unit 3 secondary water chemistry has undergone two major changes. Originally the secondry side was on phosphate treatment, with the sodium-to-phosphate molar ratio maintained between 1.0 and 2.5. This ratio was changed to 2.3 to 2.6 in December of 1973 in keeping with NSSS vendor secondry chemistry recommendations. Again on the recommendation of our NSSS vendor, secondary water chemistry was changed to the all-volatile treatment method (AVT) in November of 1974. Unit 3 has continued to operate with AVT secondary water chemistry since that time.

A summary of Unit 3 condenser inleakages follows:

5-28-73
6-10-73
6-17-73
7-23-73
7-25-73
9-11-73
9-27-73
10-2-73
11-10-73
11-24-73

2-22-74

4-24-75
8-12-75
9-26-75
9-20-75
10-23-75
12-27-75

1-27-76
2-3-76
4-11-76
4-15-76
5-2-76

2-3-77
2-25-77
7-19-77
7-22-77
11-9-77

3-6-78
3-13-78
4-26-78
4-28-78
7-7-78
7-10-78
7-18-78
7-30-78
8-1-78
8-8-78
9-22-78
10-12-78
11-27-78
12-1-78
12-6-78

10-2-79
10-15-79

2-22-80
2-25-80

APPENDIX D

Turkey Point Units 3 and 4 received extensive AEC review on turbine missiles during the construction permit and operating license stages. Licensing submittals regarding turbine missles began as early as 1966 and have included:

PSAR Supplement No. 3, September 8, 1966
PSAR Supplement No. 8, November 4, 1966
FSAR Revision No. 1, March 16, 1970
FSAR Revision No. 11, February 25, 1971
FSAR Revision No. 12, March 3, 1971

Turbine design analyses and missile protection criteria are provided in FSAR Section 14.1.13 and FSAR Appendix 5E respectively. AEC final position of acceptance on turbine missile design is provided at Section 4.8 in the Turkey Point Unit 3 and 4 Safety Evaluation Report, March 16, 1972.

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