

R. REFERENCES

R.1 Textbook References

- [T1] McCloskey et al, Turbine Steam Path Damage: Theory and Practice, Vol 1 & 2, TR-108943, 1998
- [T2] Malvern LE, Introduction to the Mechanics of a Continuous Medium, Prentice-Hall, UK, 1969.
- [T3] Chandrupatla TR, Introduction to Finite Elements in Engineering, Prentice-Hall, 1991.
- [T4] Spencer AJM, Continuum Mechanics, Longman Scientific & Technical, 1980.
- [T5] Sokolnikoff IS, Mathematical Theory of Elasticity, Krieger Publishing Company, Reprint Edition, 1983.
- [T6] Fenner RT, Engineering Elasticity, Ellis Horwood Ltd, 1986.
- [T7] Zienkiewicz OC, The Finite Element Method, McGraw-Hill, Third edition, 1982.
- [T8] Kreyszig E, Advanced Engineering Mathematics, John Wiley & Sons, Fourth edition, 1979.
- [T9] Kaplan W, Advanced Mathematics for Engineers, Addison-Wesley Publishing Company, Fourth edition, 1981.
- [T10] Knott JF, Fundamentals of Fracture Mechanics, Butterworths, 2nd edition, 1976.
- [T11] Broek D, Elementary Engineering Fracture Mechanics, Martinus Nijhoff Publishers, Third revised edition, 1982.
- [T12] Rolfe & Barsom, Fracture and Fatigue Control in Structures – Applications of Fracture Mechanics, Prentice-Hall, 1977
- [T13] Kanninen/Popelar, Advanced Fracture Mechanics, Oxford University Press, USA, 1985.
- [T14] Banantine JA et al, Fundamentals Of Metal Fatigue Analysis, Prentice-Hall, 1990.
- [T15] Larson LH, Subcritical Crack Growth Due to Fatigue, Stress Corrosion and Creep, Elsevier Applied Science Publishers, 3rd Edition, 1981.

R.2. Paper References

- [P1] Viswanathan R et al, "Metallurgical Factors Affecting the Reliability of Fossil Steam Turbine Rotors", Transactions of the ASME – Journal of Engineering for Gas Turbines and Power, vol. 107, no. 3, p. 642 – 651, July 1985.
- [P2] Westergaard HM, Bearing Pressures and Cracks, Journal of Applied Mechanics, 6, 1939.
- [P3] Sih CG, On the Westergaard method of crack analysis, International Journal of Fracture Mechanics, vol. 2, 1966.
- [P4] Eftis J and Liebowitz, On the Modified Westergaard Equations for Certain Plane Crack Problems, International Journal of Fracture Mechanics, vol. 8 no. 4, 1972.
- [P5] Sneddon IN, The distribution of stress in the neighbourhood of a crack in an elastic solid, Procedures of Royal Society of London A187, 1946.
- [P6] Tan, CL, Boundary Integral Equation Stress Analysis of a Rotating Disc with a Corner Crack, Journal of Strain Analysis, Vol 18, No 4, 1983
- [P7] Bush SH, "Failures in Large Steam Turbine Rotors", Rotor Forgings for Turbines and Generators, ed. R.I. Jaffee, EPRI Report WS 79-235, 1979, p1.1.
- [P8] Jack AR et al., "Cracking in 500MW LP Rotor Shafts", Paper #C107/77, in the Influence of Environment on Fatigue, Instn of Mechanical Engineers, England, pp. 75-83 (1977).
- [P9] Buchheit RD et al., "Metallurgical Failure Analyses of two Low Pressure Steam Turbine Shafts." Microstructural Science, Vol 11, Orlando, Fla, USA, 18 – 21 July 1982.
- [P10] EPRI Report No. CS-4160, Life Assessment And Improvement Of Turbo-Generator Rotors For Fossil Plants, edited by Ramaswamy Viswanathan, 1985, "Failure analysis of a circumferentially cracked steam turbine shaft", R. Viswanathan, pages 7-1 to 7-29.
- [P11] EPRI Report No. CS-4160, Life Assessment And Improvement Of Turbo-Generator Rotors For Fossil Plants, edited by Ramaswamy Viswanathan, 1985, "Weld repairs on fossil LP rotors", S.M. Gaitonde, pages 7-81 to 7-90.
- [P12] EPRI Report No. CS-4160, Life Assessment And Improvement Of Turbo-Generator Rotors For Fossil Plants, edited by Ramaswamy Viswanathan, 1985, "Weld repair of Shawville #4 LP Rotor", S.K. Saha & J.F. Conway, pages 7-81 to 7-90.

- [P13] Imam I et al, Development of an On-Line Rotor Crack Detection System, Journal of Vibration, Acoustics, Stress and Reliability in Design, Vol 111, 1989.
- [P14] Grabowski B, The Vibrational Behaviour of a Turbine Rotor Containing a Transverse Crack, Journal of Mechanical Design, Trans. ASME, Vol 102, 1980.
- [P15] Mayes IW et al., Method of Calculating the Vibrational Behaviour of Coupled Rotating Shafts Containing a Transverse Crack, Institute of Mechanical Engineering Conference Publication 1980-4, Second International Conference on Vibrations in Rotating Machinery, Cambridge, England, pp17-27, 1980.
- [P16] Feldman M et al., Damage Diagnosis of Rotors: Application of Hilbert Transform and Multihypothesis Testing, Journal of Vibration and Control, Vol 5, pp 421-442, 1999
- [P17] Wauer J, On the Dynamics of Cracked Rotors: A literature Survey, ASME Book No AMR067, Applied Mechanics Reviews, Vol 43, No 1, 1990
- [P18] Gash R, Dynamic Behaviour of a Simple Rotor with a Cross-Sectional Crack, Conference on Vibrations in Rotating Machinery, University of Cambridge, September 1976
- [P19] Henry TA et al, Vibrations in Cracked Shafts, Conference on Vibrations in Rotating Machinery, University of Cambridge, September 1976
- [P20] Mayes IW et al, The Vibrational Behaviour of a Rotating Shaft System Containing a Transverse Crack, Conference on Vibrations in Rotating Machinery, University of Cambridge, September 1976
- [P21] Dimarogonas AD and Papadopoulos CA, Vibration of cracked shafts in bending, Journal of Sound and Vibration, Vol 91, No 4, 1983
- [P22] Papadopoulos CA and Dimarogonas AD, Coupled longitudinal and bending vibrations of a rotating shaft with an open crack, Journal of Sound and Vibration, Vol 117, 1987
- [P23] Papadopoulos CA and Dimarogonas AD, Stability of Rotors in the Coupled Vibration Mode, Transactions of ASME, Journal of Vibration, Acoustics, Stress and Reliability in Design, Vol 11, 1988
- [P24] Papadopoulos CA and Dimarogonas AD, Coupled Longitudinal Vibrations of a Cracked Shaft, Journal of Vibration, Acoustics, Stress and Reliability in Design, Vol 110, 1988
- [P25] Grabowski B, The Vibration Behaviour of a Turbine Rotor Containing a Transverse Crack, ASME Design Engineering Technology Conference, Paper No. 79-DET-67, 1979

- [P26] Muszynska A, Shaft Crack Detection, Seventh Machinery Dynamics Seminar, National Research Council Canada, 1982
- [P27] Bentley DE and Muszynska A, Detection of Rotor Cracks, Proceedings Texas A&M 15th Turbomachinery Symposium, Corpus Christi, Nov 1986
- [P28] Nelson HD and Nataraj C, The Dynamics of a Rotor System with a Cracked Shaft, Journal of Vibration, Acoustics, Stress and Reliability in Design, Vol 108, 1986
- [P29] Scheibel et al, An Expert System-Based, On-Line Rotor Crack Monitor for Utility Steam Turbines, Proceedings of the American Power Conference, Chicago, 1989
- [P30] Imam et al, Development of an On-Line Rotor Crack Detection and Monitoring System, Journal of Vibration, Acoustics, Stress and Reliability in Design, Vol 111, No 3, 1989
- [P31] Wauer J, Modelling and Formulation of Equations of Motion for Cracked Rotating Shafts, International Journal of Solids and Structures, Vol 26, 1990
- [P32] Collins et al, Detection of Cracks in Rotating Timoshenko Shafts using Axial Impulses, Transactions of ASME, Journal of Vibration and Acoustics, Vol 113, 1991
- [P33] Sekhar et al, Crack Detection and Vibration Characteristics of Cracked Shafts, Journal of Sound and Vibration, Vol 157, 1992
- [P34] Ratan et al, On-Line Identification and Location of Cracks, Journal of Sound and Vibration, Vol 194, No 1, 1996
- [P35] Ballo I, Non-Linear Effects of Vibration of a Continuous Transverse Cracked Slender Shaft, Journal of Sound and Vibration, Vol 217, No 2, 1998
- [P36] Mashemi et al, A New Dynamic Finite Element (DFE) Formulation for Lateral Free Vibrations of Euler-Bernoulli Spinning Beams Using Trigonometric Shape Functions, Journal of Sound and Vibration, Vol 220, No 4, 1998
- [P37] Feldman and Seibold, Damage Diagnostics of Rotors: Application of Hilbert Transform and Multihypothesis Testing, Journal of Vibration and Control, Vol 5, 1999
- [P38] Aubry P et al., Prediction of critical size of defects in turbine shafts with or without a central bore, Fracture '84, Vol 5.
- [P39] Rogers GW et al., Analysis of a Turbine Rotor Containing a Transverse Crack at Oak Creek Unit 17, Failure Analysis Associates, Palo Alto, Unknown Journal, 1982.

- [P40] Shih TT et al., Effects of Temperature and Frequency on the Fatigue Crack Growth Rate Properties of a 1950 Vintage CrMoV Rotor Material, Fracture Mechanics, ASTM STP 677, CW Smith ed., American Society for Testing and Materials, 1979.
- [P41] Saviadis G et al., Consideration of Multiaxiality in Fatigue Life Prediction Using the Closure Concept, Fatigue and Fracture of Engineering Materials & Structures, Vol. 20, No. 7, 1997
- [P42] Hourlier F et al., Fissuration par fatigue sous sollicitations polymodales (mode I ondulè + mode III permanent) d'un acier pour rotors 26 NCDV 14, Mèmoires Scientifiques Revue Mètallurgie, March 1979.
- [P43] Tschegg EK et al., "Influence Of A Constant Mode III Load On Mode I Fatigue Crack Growth Threshold", in Fatigue under biaxial and multi-axial loading, ESIS 10 [Edited by K.F. Kussmaul, D.L. McDiarmid and D.F. Soue], Mechanical Engineering Publications, London, pp. 213 – 222, 1991.
- [P44] Baker S, Three Dimensional Constraint Effects on Stress Intensity Distributions in Plate Geometries with Through Thickness Cracks, Fatigue and Fracture of Engineering Materials & Structures, Vol. 15, No. 11, 1992
- [P45] Miller KJ, The Behaviour of Short Fatigue Cracks and Their Initiation, Fatigue and Fracture of Engineering Materials & Structures, Vol. 10, No. 1, 1987
- [P46] Lal DN, A Model for the Combined Effects of Stress Ratio and Grain Size on LEFM Fatigue Threshold Condition, Fatigue and Fracture of Engineering Materials & Structures, Vol. 15, No. 8, 1992
- [P47] Kage et al., Fatigue Crack Initiation and Propagation in a Low-Carbon Steel of Two Different Grain Sizes, Fatigue and Fracture of Engineering Materials & Structures, Vol. 15, No. 8, 1992
- [P48] Lindley TC, Near Threshold Fatigue Crack Growth: Experimental Methods, Mechanisms and Applications, in Subcritical Crack Growth Due to Fatigue, Stress Corrosion and Creep edited by Larson LH, Elsevier Applied Science Publishers, 3rd Edition, 1981.
- [P49] Lal DN, A Model for the Effect of a Gaseous Environment on the LEFM fatigue Threshold Condition of Steels, Fatigue and Fracture of Engineering Materials & Structures, Vol. 15, No. 8, 1992
- [P50] Yates JR et al, Mixed Mode (I + III) Fatigue Thresholds in a Forging Steel, Fatigue and Fracture of Engineering Materials & Structures, Vol. 12, No. 3, 1989
- [P51] Yates JR et al, The Effect on Mean Stress on Mixed Mode (I + III) Fatigue Thresholds, Fatigue and Fracture of Engineering Materials & Structures, Vol. 16, No. 12, 1993

- [P52] Bold PE et al, A Review of Fatigue Crack Growth in Steels Under Mixed Mode I and II Loading, *Fatigue and Fracture of Engineering Materials & Structures*, Vol. 15, No. 10, 1992
- [P53] You BR et al, Fatigue Crack Growth Behaviour of SM45C Steel Under Cycling Mode I with Superimposed Static Mode II Loadings, *Fatigue and Fracture of Engineering Materials & Structures*, Vol. 20, No. 7, 1997

R.3. Undisclosed Documentation

- [U1] TSI Documentation
- [U2] Bently Rotor Dynamics Research Corporation, Effect of Shaft Crack Propagation in Low Pressure Steam Turbine Centerspan on Rotor Lateral Vibration, Draft report submitted to TSI, 2000

