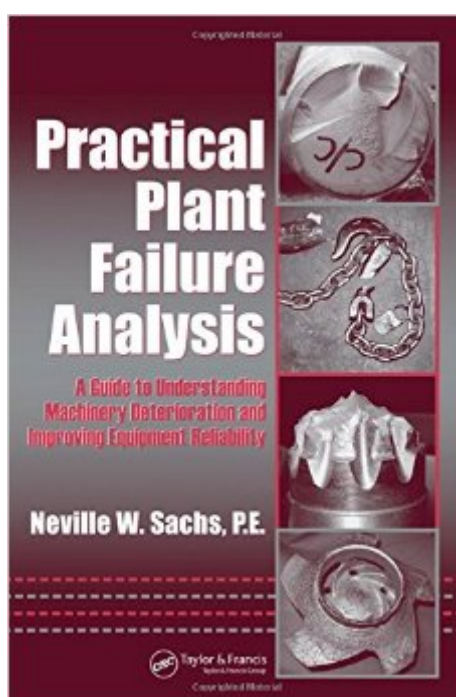


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# Practical Plant Failure Analysis: A Guide To Understanding Machinery Deterioration And Improving Equipment Reliability (Mechanical Engineering)



## Synopsis

Component failures result from a combination of factors involving materials science, mechanics, thermodynamics, corrosion, and tribology. With the right guidance, you don't have to be an authority in all of these areas to become skilled at diagnosing and preventing failures. Based on the author's more than thirty years of experience, *Practical Plant Failure Analysis: A Guide to Understanding Machinery Deterioration and Improving Equipment Reliability* is a down-to-earth guide to improving machinery maintenance and reliability. Illustrated with hundreds of diagrams and photographs, this book examines:

- When and how to conduct a physical failure analysis
- Basic material properties including heat treating mechanisms, work hardening, and the effects of temperature changes on material properties
- The differences in appearance between ductile overload, brittle overload, and fatigue failures
- High cycle fatigue and how to differentiate between high stress concentrations and high operating stresses
- Low cycle fatigue and unusual fatigue situations
- Lubrication and its influence on the three basic bearing designs
- Ball and roller bearings, gears, fasteners, V-belts, and synchronous belts

Taking a detailed and systematic approach, *Practical Plant Failure Analysis* thoroughly explains the four major failure mechanisms—wear, corrosion, overload, and fatigue—as well as how to identify them. The author clearly identifies how these mechanisms appear in various components and supplies convenient charts that demonstrate how to identify the specific causes of failure.

## Book Information

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## Customer Reviews

Only two books are kept within reach on my desk, and Practical Plant Failure Analysis is one of them. I took the course from Neville several years ago and really enjoyed learning so much about failure analysis “ and about how to design/install/maintain equipment to avoid these failures in the first place. The man has an amazing wealth of knowledge, and this book captures it in a way that is easy to follow. It explains the engineering principles that underly equipment behavior, but if you donâ™t have the time for or the interest in reading those parts, you can go right to the step-by-step instructions and work your way through them. Have a fastener failure? Go to the fastener section, look at the pictures, answer the questions, and youâ™ve got your diagnosis. Same with gears, bearings, belts, and so on. I have used this book many times to help evaluate broken parts and implement solutions, and it has paid for itself thousands of times over in increased equipment reliability.

Neville Sachs has developed an excellent technical resource for plant Maintenance and Reliability Engineers. In addition to the book I highly recommend the on-site course taught by the author. Mr. Sachs has a wealth of knowledge and practical experience to help improve safety and profitability of our facilities. Excellent book.

This is a great book in order to analyze many mechanical failures. It is a good starting point for root cause analysis for shafts, gears, splines etc. Writer shared his knowledge and experience in readable manner. I recommend this book for all reliability and safety engineers.

I purchased this book to help me with a new position as reliability engineer. The plant was experiencing chronic vacuum pump ball bearing failures, and countermeasures to date had been ineffective. The procedure approach to analysis and diagnosis, as well as the pictures and examples were a great help in solving this issue. Money well spent, very useful.

I own 2 copies of this book. One I purchased and read for my work several years ago. The second I received from attending the training offered from the author's company. I regularly use both, one at my work desk and one in my home office. This is an excellent book on the subject of mechanical

failure analysis. It's comprehensive yet concise, doesn't read like an engineering tome, and has helped me improve my analysis abilities greatly. Just as it states, this book fills in the practical details and procedures left out of most machine design / failure references. Pros: See above...Cons: I'd like to see more of the pictures in full color instead of grayscale. They certainly get the job done as-is, but color would be a nice improvement.

If you buy one book to assist in analyzing plant failures, this is it. This book has step by step methods to analyze a variety of components and it also has photographs accompanying each section. I keep this book open on my desk all the time. It is also helpful in developing asset strategies to alleviate future failures.

"Practical Plant Failure Analysis: A Guide To Understanding Machinery Deterioration And Improving Equipment Reliability" provides students of mechanical engineering with an interdisciplinary approach to the concept that component failures result from a combination of factors that involve materials science, mechanics, thermodynamics, corrosion, and tribology. Author Neville W. Sachs draws upon his more than thirty years of experience and expertise to provide the reader with a practical, informative, guide to improving machinery maintenance and reliability. "Practical Plant Failure Analysis" presents practical guidance on failure mechanism, including what leads to these failures and how to avoid them, as well as featuring 'user friendly' charts to logically diagnose a failure and take the appropriate correction action. "Practical Plant Failure Analysis" offers a clear and detailed explanation of the differences between through- and case-hardened gear teeth, while its informed and informative text is enhanced with more than 300 photographs and illustrations to develop competence and confidence in visually diagnosing machinery failures. An essential reference and comprehensive instructional guide to diagnosing and dealing with machinery failure, "Practical Plant Failure Analysis" is a core addition to academic, trade school, and professional reference library collections.

Congratulations to you Mr. Sachs, I believe this is the best book on my shelf. I wish everybody wrote with such thoroughness & readability. This is a top notch work on failure analysis.

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