

SKUPOVI



EVENTS

## SEMINAR – TRAINING COURSE

INTEGRITET KONSTRUKCIJA UGROŽENIH  
KOROZIJOM

Seminar je održan 17. decembra 2007. godine u TE „Nikola Tesla“ (TENT) u Obrenovcu. Učesnici seminara su dobili časopis *Integritet i vek konstrukcija* broj 2/2007, kao i CD sa održanim izlaganjima. Ovo je bio treći po redu seminar koji *Društvo za integritet i vek konstrukcija* (DIVK) organizuje za saradnike iz TENT.

Prvi je bio petodnevni seminar od 40 časova „Ispitivanje opreme pod pritiskom (OPP) u eksploataciji i procena veka“ (prema zahtevima PED 97/23/EC i Zakona o energetici) sa 14 časova eksperimentalnih vežbi, održan maja 2005. godine. Predavanja su držali članovi DIVK, a praktična obuka je izvedena na Tehnološko-metalurškom fakultetu Univerziteta u Beogradu, u Vojnotehničkom institutu i u preduzećima CertLab i Konmat. Polaznici su dobili sertifikate.

Drugi seminar u TENT „Iskustva iz eksploatacije čelika P/T 91“ je održan 18. aprila 2006. Na ovom seminaru su A. Jakovljević, G. Bakić, P. Šekeljčić i S. Sedmak prikazali sadržaj kursa za obuku „Proizvodnja, zavarivanje, termička obrada, oksidacija, mehanizmi oštećenja i ocena integriteta i veka čelika P/T 91“ i seminara „Iskustva iz industrije i istraživanja o primeni čelika P/T 91 u HRSG (Generatori pare na visokoj temperaturi) i konvencionalnim kotlovima“.

INTEGRITY OF STRUCTURES ENDANGERED  
BY CORROSION

The seminar was held on December 17, 2007 at TE “Nikola Tesla” (TENT) in Obrenovac. All participants received a copy of the journal *Structural Integrity and Life*, issue 2/2007, and a CD with presentations held. This was the 3<sup>rd</sup> seminar in a row that the *Society for Structural Integrity and Life* (DIVK) had organised for TENT personnel.

The first was the five-day 40-hour training course “Inspection of pressurized equipment (PE) in service and life assessment” (according to PED 97/23/EC and Law for Energetics) with 14 hours of experimental exercises held in May 2005. Lectures were given by DIVK members, and practical training was held at the Faculty of Technology and Metallurgy–University of Belgrade, Military Technical Institute, and at companies CertLab and Konmat. Participants had received certificates.

The second seminar at TENT “Experiences from service with steel P/T 91” was held on April 18, 2006. A. Jakovljević, G. Bakić, P. Šekeljčić and S. Sedmak held a training course “Manufacturing, welding, heat treatment, oxidation, damage mechanisms and structural integrity and life assessment of steel P/T 91”, and a seminar “Experiences from industry and research in the application of steel P/T 91 in HRSG and conventional boilers.”

**Program seminara – Training course programme**

Predavači – Lecturers	Naziv predavanja	Lecture title
Ljubinka Rajaković	Korozijski procesi u termoenergetskim postrojenjima usled neadekvatnog kvaliteta vode	Corrosion processes in thermal power plants due to inadequate water quality
Miodrag Stojanović	Ispitivanje i ocena otpornosti prema koroziji konstrukcijskih materijala u različitim uslovima eksploatacije	Testing and assessment of corrosion resistance of structural materials in different working conditions
Antonije Onjia	Fizičko-hemijske karakteristike vodene sredine na termoenergetskim objektima	Physical-chemical properties of water media in power plant equipment
Vera Šijački-Žeravčić, G. Bakić, M. Đukić, B. Anđelić, B. Rajičić	Izbor materijala za konstrukcije izložene koroziji	Selection of materials for structures exposed to corrosion
Bratislav Milošević	Antikorozijska zaštita energetskih postrojenja premaznim sredstvima	Anti-corrosion coating protection of power plant equipment
Slobodan Čubrilović, G. Mandić	Primeri otkaza zbog korozije postrojenja JKP „Beogradske elektrane“	Examples of failure by corrosion on equipment from JKP “Beogradske elektrane”
Bore Jegdić, B. Bobić	Korozija zavarenih spojeva	Corrosion of welded joints
Nadežda Filipović	Analiza oštećenja od korozije	Corrosion damage analysis
Gordana Bakić, V. Šijački-Žeravčić, M. Đukić, B. Rajičić, B. Anđelić	Ocena integriteta termoenergetskih postrojenja	Structural integrity assessment of power plant equipment
Stojan Sedmak	Procena veka komponenti sa početnom korozijom	Life assessment of components with initial corrosion

**Spisak učesnika – List of participants**

1 Dragan Cerović	4 Dragana Dimitrijević	8 Ljubiša Jocić	12 Andrej Prodanović	15 Momčilo Stanić
2 Ilija Čairović	5 Nenad Đorđević	9 Nikola Kuzmanović	13 Slavica Radeč	16 Stanimir Vraneš
3 Jelena Damjanac	6 Dragan Đurić	10 Snežana Majstorović	14 Slobodan Spasojević*	17 Ljubinka Vujnović
	7 Slobodan Grubješić	11 Vladimir Paunović		

ČETVRTA GODIŠNJA KONFERENCIJA DRUŠTVA  
ZA INTEGRITET I VEK KONSTRUKCIJA

Četvrta godišnja konferencija Društva za integritet i vek konstrukcija (DIVK) je održana u Institutu za ispitivanje materijala u Beogradu 15. i 16. novembra 2007. godine. Prvog dana je održan seminar „Integritet i vek mostova“, a drugog dana su saopšteni radovi.

FOURTH ANNUAL CONFERENCE OF THE SOCIETY  
FOR STRUCTURAL INTEGRITY AND LIFE

The Fourth Annual Conference of the Society for Structural Integrity and Life (DIVK) took place at the Institute for Materials Testing in Belgrade on 15–16 November 2007. On the first day the seminar “Integrity and Life of Bridges” was held, and papers were presented on the second day.

### Seminar Integritet i vek mostova

Seminar „Integritet i vek mostova“ je održan u Institutu za ispitivanje materijala u Beogradu 15. novembra 2007. godine u okviru 4. godišnje konferencije DIVK.

Seminaru je prisustvovalo 42 učesnika. Pored članova DIVK učestvovali su i stručnjaci preduzeća Mostogradnja i JP Putevi Srbije, Građevinskog fakulteta Univerziteta u Beogradu, Inovacionog centra Mašinskog fakulteta Univerziteta u Beogradu i Vojno-tehničkog instituta u Beogradu.

### Seminary

#### Integrity and Life of Bridges

The seminary “Integrity and Life of Bridges” took place at the Institute of Materials Testing in Belgrade on November 15, 2007 as a part of the 4<sup>th</sup> Annual Conference of the DIVK.

The seminary attracted 42 participants. In addition to DIVK members, experts from companies as *Mostogradnja* and *JP Putevi Srbije*, the Faculty of Civil Engineering and Innovation Centre of the Faculty of Mechanical Engineering, University of Belgrade, and the Military Technical Institute in Belgrade, had taken part.

#### Program seminara – Seminary programme

Predavači – Lecturers	Naziv predavanja	Lecture title
Aleksandar Sedmak	Uvodno predavanje	Introductory speech
Bratislav Stipanić	Faktori od značaja za trajnost mostova	Factors of importance for bridge durability
Mihail Murevljov, Dejan Bajić	Održavanje i rehabilitacija betonskih mostova	Maintenance and retrofit of concrete bridges
Dragoslav Šumarac, Slavica Obradović-Šumarac	Rekonstrukcija bombardovanjem oštećenih čeličnih mostova	Reconstruction of steel bridges damaged by bombardment
Miodrag Pavišić	Totalni progresivni lom mostovske konstrukcije	Total progressive damage of bridge structure
Zoran Ribić	Sanacija mostova od prethodno napregnutog betona na međunarodnom putu E-75 Novi Sad–Beograd	Retrofit of pre-stressed concrete bridges on highway E-75 Novi Sad–Beograd
Dejan Momčilović, N. Hut	Iskustva IMS u ispitivanju materijala elemenata mostovskih konstrukcija	Experiences of the Institute for Materials Testing in testing bridge element materials
Zijah Burzić, Milorad Zrilić	Ekperimentalno određivanje zaostalih napona na čeličnoj konstrukciji mosta	Experimental determination of residual stresses on bridge steel structure
Tihoslav Tošić	Značaj tehnologije proizvodnje za integritet i vek čeličnih mostova	Significance of the manufacturing technology for structural integrity and life of bridges
Igor Svetel, Miodrag Kirić	Informaciono tehnološki standardi u kontroli i održavanju komponenti mostova podložnih lomu: Primena pri ispitivanju bez razaranja	Information technology standards for inspection and maintenance of bridge components susceptible to failure: Application of non-destructive testing

#### Predavači i učesnici seminara – Seminary lecturers and participants



Prof. Aleksandar Sedmak



Prof. Bratislav Stipanić



Prof. Mihailo Muravljov



Prof. Dragoslav Šumarac



Miodrag Pavišić, dipl. ing.



Zoran Ribić, dipl. ing.



Mr Dejan Momčilović



Dr Zijah Burzić



Tihoslav Tošić, dipl. ing.



Dr Igor Svetel



Dr Miodrag Kirić



učesnici seminara – seminary participants



učesnici seminara – seminary participants

### Radovi saopšteni na Četvrtoj godišnjoj konferenciji DIVK

Na IV Godišnjoj konferenciji DIVK je prisustvovalo 33 učesnika, koji su pratili 16 saopštenih radova.

### Papers presented at the Fourth Annual Conference of DIVK

The IV Annual Conference of DIVK had 33 participants that attended 16 presented papers.

Predavači – Lecturers	Naziv predavanja	Lecture title
J. Kurai, Z. Burzić, S. Sedmak, M. Zrilić	Praćenje deformacijskog i naponskog stanja na cevima kotla pri probi hladnim vodenim pritiskom	Monitoring stress-strain state in boiler tubes during pressure proof test by cold water
Dž. Gačo, M. Burzić, S. Sedmak, Z. Burzić	Uticao temperature i vremena eksploatacije na svojstva visokolegiriranog čelika X20 u prisustvu greške tipa prsline	Effects of operating temperature and time on high alloyed steel X20 in presence of a crack-like defect
M. Burzić, Z. Burzić, J. Kurai	Uticao promenljivog opterećenja na ponašanje zavarenog spoja legiranog čelika za rad na povišenim temperaturama	Effect of variable load on the behaviour of welded joint of high temperature alloy steel
D. Georgijević, Z. Burzić	Ocena integriteta kolosečnog pričvrstnog pribora FOSSLOH W14	Structural integrity assessment of rail fixture accessories FOSSLOH W14
M. Ugrčić	Primena satnog mehanizma u konstrukciji artiljerijskih upaljača	Application of clock mechanism in the design of artillery ignitors
D. Momčilović, D. Jaković, I. Atanasovska	Klasifikacija oštećenja čeličnih užadi u eksploataciji	Damage classification of steel ropes in exploitation
V. Šijački-Žeravčić, M. Đukić, G. Bakić, B. Rajičić	Analiza mehanizama i uzročnika oštećivanja cevi u kotlu	Analysis of mechanisms and causes of boiler tube damages
V. Šijački-Žeravčić, G. Bakić, M. Đukić, B. Rajičić	Strukturni integritet reparaturno zavarenih spojeva posuda pod pritiskom	Structural integrity of repair welded joints on pressure vessels
S. Sedmak, M. Kirić, A. Sedmak	Kriterijumi integriteta i pouzdanosti u mehanici loma	Criteria of integrity and reliability in fracture mechanics
S. Maksimović	Procena preostalog veka elemenata konstrukcija u prisustvu inicijalnih oštećenja	Analysis of fracture mechanics parameters in the presence of initial damages
M. Blažić	Analiza parametara mehanike loma primenom metoda konačnih elemenata	Analysis of fracture mechanics by applying the finite element method
I. Ilić	Analiza čvrstoće mehaničkih spojeva od kompozitnih materijala	Strength analysis of mechanical joints of composite materials
M. Četković, Đ. Vuksanović	Ponašanje kompozitnih ploča pod različitim vrstama opterećenja	The behaviour of composite plates under different loading types
M. Arsić, V. Aleksić	Metodološki pristup ispitivanju opreme pod pritiskom u izradi i eksploataciji	Methodological approach to testing pressurized equipment in manufacture and exploitation
M. Dobrojević, M. Rakin, N. Gubelj, A. Sedmak	Modeliranje početka rasta prsline u uslovima nastanka žilavog loma zavarenog spoja	Modelling crack growth initiation in conditions of ductile fracture of welded joint
M. Kirić, A. Sedmak	Neki aspekti inženjerskog pristupa oceni integriteta konstrukcije	Some aspects of engineering approach to structural integrity assessment

#### Predavači i učesnici konferencije – Conference lecturers and participants



Doc. Milorad Zrilić



Mr Meri Burzić



Dragutin Georgijević, dipl. ing.



Dr Marinko Ugrčić



Mr Miloš Đukić



Mr Gordana Bakić



Prof. Stojan Sedmak



Dr Stevan Maksimović



Ivana Ilić, dipl. ing.



Mr Marina Četković



Dr Miodrag Arsić



Doc. Marko Rakin



učesnici konferencije – conference participants



dogovori u pauzi – consulting during breaks

S. Sedmak

POZIV



**GODIŠNJA SKUPŠTINA  
DRUŠTVA ZA INTEGRITET I VEK KONSTRUKCIJA (DIVK)**

**Svečana sala Instituta za ispitivanje materijala (IMS)  
Beograd, Bulevar vojvode Mišića 43**

**Četvrtak, 21. februar 2008. u 13:30 časova**

*Poštovani članovi DIVK*

Upravni odbor DIVK Vas poziva da uzmete učešće na  
**Sedmoj godišnjoj skupštini Društva za integritet i vek konstrukcija**  
na kojoj će se sumirati rezultati jednogodišnjeg rada DIVK.

**Dnevni red**

1. Izveštaj Upravnog odbora o radu u protekloj godini
2. Finansijski izveštaj za 2007. godinu
3. Izveštaj Nadzornog odbora
4. Izveštaj o radu časopisa „Integritet i vek konstrukcija“ u 2007. godini
5. Plan rada u 2008. godini
6. Promocija broja 3/2007 časopisa „Integritet i vek konstrukcija“
7. Razno

Predsednik DIVK  
Prof. dr Aleksandar Sedmak

**DESETA MEĐUNARODNA ŠKOLA MEHANIKE LOMA (IFMASS 10)****„Osnove mehanike loma i integriteta konstrukcija“**

Predlog programa i raspored

Br.	Termin	Predavač	Saradnik	Naslov predavanja
<b>Ponedjeljak, 23. jun</b>				
1.	9:30 – 10:30	Stojan Sedmak		Otkazi konstrukcija u eksploataciji
2.	10:30 – 11:30	Majkl Vnuk	Petar Agatonović	Pristupi mehanike loma
3.	11:30 – 12:30	Marko Rakin		Faktor intenziteta napona i otvaranje prsline
	12:30 – 16:00	Pauza za ručak		
4.	16:00 – 17:00	Aleksandar Sedmak		J integral i C* integral
5.	17:00 – 18:00	Petar Agatonović		Linearno-elastična i elasto-plastična mehanika loma
<b>Utorak, 24. jun</b>				
6.	9:30 – 10:30	Milosav Ognjanović	Katarina Gerić	Zamor materijala
7.	10:30 – 11:30	Bore Jegdić	Miodrag Stojanović	Korozija
8.	11:30 – 12:30	Vera Šijački - Žeravčić		Puzanje
	12:30 – 16:00	Pauza za ručak		
9.	16:00 – 17:00	Zijah Burzić		Standardna ispitivanja parametara mehanike loma
10.	17:00 – 18:00	Zoran Radaković	Stojan Sedmak	Terminologija i standardi mehanike loma
<b>Sreda, 25. jun</b>				
11.	9:30 – 10:30	Nenad Gubeljak	Marko Rakin	Postupci za ocenu integriteta konstrukcija
12.	10:30 – 11:30	Miodrag Kirić		Ispitivanja bez razaranja
13.	11:30 – 12:30	Jano Kurai		Prikaz i analiza rezultata ispitivanja bez razaranja
	12:30 – 16:00	Pauza za ručak		
14.	16:00 – 17:00	Milorad Zrilić		Ekperimentalne metode u oceni integriteta konstrukcija
15.	17:00 – 18:00	Taško Maneski		Numeričke metode u oceni integriteta konstrukcija
<b>Četvrtak, 26. jun</b>				
16.	9:30 – 10:30	Miodrag Arsić		Ocena integriteta opreme pod pritiskom
17.	10:30 – 11:30	Dragoslav Šumarac		Ocena integriteta građevinskih konstrukcija
18.	11:30 – 12:30	Vencislav Grabulov		Integritet zavarenih konstrukcija
	12:30 – 16:00	Pauza za ručak		
19.	16:00 – 17:00	Vera Šijački - Žeravčić	Gordana Bakić	Ocena integriteta konstrukcija - primeri
20.	17:00 – 18:00	Igor Svetel		Informatički pristup integritetu konstrukcija
<b>Petak, 27. jun</b>				
21.	9:30 – 10:30	Stojan Sedmak		Retrospektiva uspeha mehanike loma i novi izazovi
	10:30 – 12:30			Diskusija o oceni integriteta konstrukcija i značaju prsline

**Koncept i krug slušalaca**

Posle razvoja i značajne primene mehanike loma kod nas, ideja je da se IFMASS oblikuje kao seminar, na kojem bi polaznici dobili osnovna znanja o mehanici loma i uputstva kako pristupiti oceni integriteta konstrukcija. Za takav nivo postoji već dovoljan broj uglednih stručnjaka u našoj zemlji, tako da bi orijentacija bila na domaće predavače.

Škola je namenjena pre svega inženjerima koji se bave problemima pouzdanosti konstrukcija, a u svakodnevnom radu im je potrebna odluka da li se postrojenja u eksploataciji i pored utvrđenih oštećenja mogu koristiti i koliko dugo.

Očekuje se oko 50 do 70 učesnika iz proizvodnje i eksploatacije konstrukcija i opreme.

**Vreme i mesto**

Od 23. do 27. juna 2008, Hotel Petrohemije, Zlatibor, Vodice.

## PREGLED STRANIH IZDAVAČA – REVIEW OF FOREIGN PUBLISHERS



Blackwell  
Publishing



BUTTERWORTH  
HEINEMANN  
Engineering



Wiley

### Encyclopedia of Structural Health Monitoring (five-volume set)

**Christian Boller**, Department of Mechanical Engineering, University of Sheffield, UK, editor-in-chief; **Fu-Kuo Chang**, Department of Aeronautics and Astronautics, School of Engineering, Stanford University, CA, USA; **Yozo Fujino**, Department of Civil Engineering, University of Tokyo, Tokyo, Japan.

Covering all aspects of structural health monitoring, this encyclopedia is an essential reference source for all engineers, engineering managers, and scientists active in the field of structural design, operational management, and maintenance.

This set provides all the background information required to understand and apply Structural Health Monitoring (SHM), and to set out the basis of configuring structural health monitoring systems.

Under the guidance of an international editorial board, leading authors from both academic and industrial research centres provide expert insights into essential SHM concepts and applications in a wide range of engineering fields. These include aerospace; road, rail and sea transport; heavy machinery; and all types of civil infrastructure, including specialist subjects such as landfills or disaster (i.e. earthquake) management. Moreover, each topic, ranging from physical and mathematical principles to real world engineering applications, is reported in depth and has a practical orientation underlined by a variety of case studies.

Structural health monitoring is a wide field of engineering with ever-increasing significance. It addresses options for integrating sensing and possibly actuation elements into structural components that will allow a structure's operational and damaging condition to be monitored, and using this information for diagnostic and prognostic purposes. This has been made possible through significant recent advances in:

- sensor and actuator miniaturisation,
- technological options for sensor adaptation and integration, in the context of composite materials and materials technology,
- sensor signal processing due to increased computational power and processing,
- wireless data communication technology.

Sections and editors:

**Introduction and Definitions:** Christian Boller, Fu-Kuo Chang, and Yozo Fujino. **Physical Monitoring Principles:** Douglas E Adams, School of Mechanical Engineering, Purdue Univ., Indiana, USA. **Signal Processing:** Wieslaw J Staszewski and Keith Worden, Univ. of Sheffield, Department of Mechanical Engineering, UK. **Simulation:** S. Gopalakrishnan, Department of Aerospace Engineering, Indian Institute of Science, Bangalore, India. **Sensors:** Victor Giurgiutiu, Department of Mechanical Engineering, Univ. of South Carolina, Columbia, SC, USA. **Systems and System Design:** Daniel Balageas, Department of Solid and Damage Mechanics, ONERA, Châtillon, France. **Principles of SHM-based Structural Monitoring, Design, and Maintenance:** Michael Bannister, CRC-ACS, Fishermans Bend, Victoria, Australia. **Aerospace Applications:** Stephen C Galea, DSTO – Melbourne, Fishermans Bend, Victoria, Australia. **Civil Engineering Applications:** Helmut Wenzel, VCE Holding GmbH, Vienna, Austria. **Emerging Applications:** Daniel J Inman, Department of Mechanical Engineering, Virginia Tech, Blacksburg, VA, USA.

5-volume set, hardcover, 2708 pages, public. date: Sep-2008  
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[www.wileyinterscience.com/reference](http://www.wileyinterscience.com/reference)

USD 1435, EUR 1099 (valid until Dec-31-2008)



Wiley InterScience

### Adaptive Structures

**David J Wagg, Ian P Bond, Paul M Weaver, Michael I Friswell**, editors.

Adaptive structures have the ability to adapt, evolve or change their properties or behaviour in response to the environment around them. Analysis and design of adaptive structures requires a highly multi-disciplinary approach which includes elements of structures, materials, dynamics, control, design and inspiration taken from biological systems. Development of adaptive structures has been taking place in a wide range of industrial applications, but is particularly advanced in the aerospace and space technology sector with morphing wings, deployable space structures; piezo-electric devices and vibration control of tall buildings.

Includes discussions of the application of adaptive structures in the aerospace, military, civil engineering structures, automotive and MEMS and presents the impact of biological inspiration in designing adaptive structures, particularly the use of hierarchy in nature, which typically induces multi-functional behaviour.

Contents:

Front Matter. **Adaptive Structures for Structural Health Monitoring:** Daniel J Inman, Benjamin L Grisso. **Distributed Sensing for Active Control:** Suk-Min Moon, Leslie P Fowler, Robert L Clark. **Global Vibration Control Through Local Feedback:** Stephen J Elliott. **Lightweight Shape-Adaptable Airfoils: A New Challenge for an Old Dream:** LF Campanile. **Adaptive Aeroelastic Structures:** Jonathan E Cooper. **Adaptive Aerospace Structures with Smart Technologies - A Retrospective and Future View:** Christian Boller. **A Summary of Several Studies with Unsymmetric Laminates:** Michael W Hyer, Marie-Laure Dano, Marc R Schultz, Sontipee Aimmanee, Adel B Jilani. **Negative Stiffness and Negative Poisson's Ratio in Materials which Undergo a Phase Transformation:** TM Jaglinski, RS Lakes. **Recent Advances in Self-Healing Materials Systems:** MW Keller, BJ Blaiszik, SR White, NR Sottos. **Adaptive Structures - Some Biological Paradigms:** Julian FV Vincent. Index.

Readership: engineers and scientists working in the fields of intelligent materials, structural vibration, control and related smart technologies. Also of interest to senior undergraduate and post-graduate research students as well as design engineers working in the aerospace, mechanical, electrical and civil engineering sectors.

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Wiley InterScience

### Corrosion of Steel in Concrete

**Luca Bertolini, editor, Bernhard Elsener, Pietro Pedferri, Rob B Polder**

Reinforced concrete has been developed and applied extensively in the 20<sup>th</sup> century. It combines good compressive strength of concrete with high tensile strength of steel and has proven to be successful in terms of structural performance and durability. However, there are instances of premature failure of reinforced concrete and prestressed concrete components due to corrosion of the reinforcing steel with very high economic implications of such damage. This book focuses on the chloride and carbonation induced corrosion of steel in concrete, presenting trans-



port mechanisms and electrochemical concepts. Other types of corrosion of steel and degradation of concrete are also treated. The main emphasis lies on design and execution aspects related to durability of new and existing structures. New methods and materials for preventative measures, condition assessment and repair techniques are discussed. An invaluable reference for any engineer and materials scientist involved in research and practice of corrosion protection, rehabilitation and maintenance of reinforced concrete structures and components.

Contents:

Front Matter.

**Part I: Properties of Cementitious Materials** (Cements and Cement Paste. Transport Processes in Concrete. Degradation of Concrete.)

**Part II: Mechanisms of Corrosion** (General Aspects. Carbonation-Induced Corrosion. Chloride-Induced Corrosion. Electrochemical Aspects. Macrocells. Stray-Current-Induced Corrosion. Hydrogen-Induced Stress-Corrosion Cracking.)

**Part III: Prevention** (Design for Durability. Concrete Technology for Corrosion Prevention. Corrosion Inhibitors. Surface Treatments. Corrosion-Resistant Reinforcement.)

**Part IV: Diagnosis** (Inspection and Condition Assessment. Monitoring.)

**Part V: Repair** (Principles and Methods for Repair. Conventional Repair. Electrochemical Techniques. Index.)

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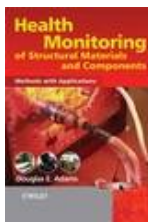
### Health Monitoring of Structural Materials and Components

Douglas E Adams

The first complete introduction to health monitoring, encapsulating both technical information and practical case studies. Written by a highly-respected figure in structural health monitoring, provides readers with technical skills and practical understanding required to solve new problems encountered in the emerging field of health monitoring. Presents a suite of methods and applications in loads identification (usage monitoring), in-situ damage identification (diagnostics), and damage and performance prediction (prognostics). Concepts in modelling, measurements, and data analysis are applied through real-world case studies to identify loading, assess damage, and predict the performance of structural components, as well as examine engine components, automotive accessories, aircraft parts, spacecraft components, civil structures and defence system components.

Provides the reader with fundamental and practical understanding of the material. Discusses models demonstrating the physical basis for health monitoring techniques. Gives a detailed review of the best practices in dynamic measurements including sensing. Presents numerous data analysis techniques using model- and signal-based methods. Discusses case studies involving real-world applications of health monitoring. Offers end-of-chapter problems to enhance the study of the topic for students and instructors. Includes an accompanying website with MATLAB programs providing hands-on training to readers for writing health monitoring model simulation and data analysis algorithms.

Readership: an excellent introductory text for newcomers to the subject and excellent study tool for students and lecturers. Practitioners and researchers, those with a greater understanding and application of the technical skills involved, will also find this essential reading as a reference text to address current and future challenges in this field. Wide variety of case studies appeals to a



broad spectrum of engineers in aerospace, civil, mechanical, machinery and defence communities.

Contents:

Front Matter. Introduction. Modeling Components. Modeling Damage. Measurements. Data Analysis. Case Studies: Loads Identification. Case Studies: Damage Identification. Case Studies: Damage and Performance Prediction (Prognosis). Appendix A. Appendix B. Index.

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### Nondestructive Testing of Deep Foundations

Bernard Hertlein, Allen Davis

Nondestructive Testing involves the use of methods such as wave propagation, electromagnetism, electrical conductivity, and thermal conductivity to test structural integrity and thereby allow nondestructive assessment of structures and the possibility of structural failures before they occur.

*Nondestructive Testing of Deep Foundations* covers different techniques designed to provide information about the integrity and quality of the material that makes up a deep foundation. Non-destructive Testing methods are used at all stages of a structure's life - from new construction quality control to residual lifetime prediction, and even during the monitoring of demolition. In addition, Nondestructive Testing is being increasingly specified in deep foundation projects, though often without a good understanding of its limitations and with the result that methods are often misused. In order to be able to specify an appropriate method, or to recognize an inappropriate specification, it is necessary for the engineer, specifier and/or contractor to understand the capabilities and limitations of each of the methods currently in use.

Describes the most commonly used deep foundation construction techniques, including typical use of material. Provides a brief history of the development of commercially available nondestructive methods. Summarises each method's capabilities and limitations. Acts as a one stop reference drawing together resources only previously available in conference proceedings and journal papers.

Readership: all practitioners in civil/structural and geotechnical engineering and architecture. Also provides a valuable insight into this highly technical field for university researchers, lecturers and postgraduates in civil/structural and geotechnical engineering.

Contents:

Front Matter. Introduction and a Brief History. Commonly Used Deep Foundation Construction Methods. How Soils Affect the Choice of Foundation Type. Traditional, Visual and New Inspection Methods for Deep Foundation Construction. A Review of Full-Scale Load-Testing Techniques. High-Strain Testing for Capacity and/or Integrity. Low-Strain Surface Tests - Sonic Echo. Sonic Mobility (Impulse Response). The Impedance-Log Analysis. Low-Strain Down-Hole Tests. Field Mock-Ups of Deep Foundations: Class-A Predictions. The Reliability of Pile Shaft Integrity Testing. Current Research. The Place of Nondestructive Testing at the Beginning of the 21<sup>st</sup> Century. Appendix I: Stress-Wave Propagation in Cylindrical Structures. Appendix II: Contact Addresses. Appendix III: Standards Referred to in this Book. Appendix IV: Sample Specifications for NDT Methods for Deep Foundations. References. Index.

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### Fibre Optic Methods for Structural Health Monitoring

Branko Glišić, Daniele Inaudi

Use of fibre optic sensors in structural health monitoring has rapidly accelerated in recent years. By embedding fibre optic sensors in structures (e.g. buildings, bridges and pipelines) it is possible to obtain real time data on structural changes such as stress or strain. Engineers use monitoring data to detect deviations from a structure's original design performance in order to optimise the operation, repair and maintenance of a structure over time.

The book is organised as a step-by-step guide to implementing a monitoring system and includes examples of common structures and their most-frequently monitored parameters. Presents a universal method for static structural health monitoring, using a technique with proven effectiveness in hundreds of applications worldwide. Discusses a variety of different structures including buildings, bridges, dams, tunnels and pipelines. Features case studies which describe common problems and offer solutions to those problems. Provides advice on establishing mechanical parameters to monitor (including deformations, rotations and displacements) and on placing sensors to achieve monitoring objectives. Identifies methods for interpreting data according to construction material and shows how to apply numerical concepts and formulae to data in order to inform decision making.

Readership: for practising engineers in fields of civil, structural and geotechnical engineering. Also of interest to academics and undergraduate/graduate students of civil and structural engineering.

Contents:

Front Matter. Introduction to Structural Health Monitoring. Fibre-Optic Sensors. Fibre-Optic Deformation Sensors: Applicability and Interpretation of Measurements. Sensor Topologies: Monitoring Global Parameters. Finite Element Structural Health Monitoring Strategies and Application Examples. Conclusions and Outlook. References. Index.

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### Structure, Deformation, and Integrity of Materials

Gijsbertus de With

This first integrated approach to thermomechanics deals equally with the atomic scale, the mesoscale of microstructures and morphology, as well as the macroscopic level of actual components and workpieces for applications. With some 85 examples and 150 problems, it covers the three important material classes of ceramics, polymers, and metals in a didactic manner. The renowned author surveys mechanical material behaviour at both the introductory and advanced level, providing reading incentive to both students as well as specialists in such disciplines as materials science, chemistry, physics, and mechanical engineering. Backed by five appendices on symbols, abbreviations, data sheets, materials properties, statistics, and a summary of contact mechanics.

Contents:

Front Matter

Part I: Overview: Introduction. Constitutive behaviour.

Part II: Fundamentals: Mathematical preliminaries. Kinematics. Kinetics. Thermodynamics. C, Q and S mechanics. Structure and bonding.

Part III: Elasticity: Continuum elasticity. Elasticity of structures. Molecular basis of elasticity. Microstructural aspects of elasticity.

Part IV: Plasticity: Continuum plasticity. Applications of plasticity theory. Dislocations. Dislocations and plasticity. Mechanisms in polymers.

Part V: Visco-elasticity: Continuum visco-elasticity. Applications of visco-elasticity theory. Structural aspects of visco-elasticity.

Part V: Fracture: Continuum fracture. Applications of fracture theory. Structural aspects of fracture. Fatigue. Perspective and outlook.

Appendix A: Units, physical constants and conversion factors. Appendix B: Properties of structural materials. Appendix C: Properties of plane areas. Appendix D: Statistics. Appendix E: Contact mechanics. Index.

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