

Academic curriculum vitae



Personal information

Name	Hasan Avdić
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E-mail/Web	Avdic.ha@bih.net.ba
Nationality	Bosnian
Date of birth	27 July 1955
Sex	Male

Present work placement/position/ profession

Assistant of the executive director for technical maintenance affairs – Coal Mines Banovići
External associate: associate professor, scientific area Terotechnology – Faculty of Mechanical Engineering in Tuzla

Work experience

Dates	trainee	25 December 1978	25 June 1979
	Engineer for technological processes	26 June 1979	11 September 1979
	Engineer for technological processes	6 August 1980	30 November 1981
	Mechanical engineer for trucks	1 December 1981	31 May 1982
	Engineer for mechanical affairs	1 June 1982	30 November 1982
	Manager for mechanical affairs	1 December 1982	30 June 1987
	Head engineer for mechanical maintenance in the same company	1 July 1987	31 August 1990

Head engineer in the technical preparation department of the mechanical maintenance section	1 September 1990	30 November 1992
Manager of the mechanical maintenance section	1 December 1992	31 May 1995
Manager of the mechanical affairs in the mine	1 June 1995	31 October 1998
Head engineer of the mechanical maintenance	1 November 1998	31 May 1999
Manager of the mechanical maintenance section	1 June 1999	15 August 2004
Expert in mechanical engineering	16 August 2004	30 November 2007
Assistant of the executive director for technical maintenance affairs	1 December 2007	present

Placement / position / profession

Basic responsibilities and duties

Assistant of the executive director for technical maintenance affairs

- Monitors, analyses, and suggests any measures in order to enlarge the effectiveness (operative efficiency, reliability and the functional suitability) of technical systems in the Coal Mines Banovići,
- Monitors, analyses and suggests measures in order to enlarge the efficacy of technical systems,
- Participates in elaborations and studies on investments of the present equipment and purchase of new equipment,
- Works on the introduction of new maintenance methods in the Coal Mines Banovići,
- Works on the introduction of terotechnological approaches in the equipment management (technical systems),
- Works on the introduction of organised technical diagnostics in order to introduce up-to-date maintenance methods of the equipment,
- Monitors, analyses and suggests measures in order to improve the maintenance system (strategy, organisation, technology),
- Monitors, analyses and suggests measures in order to reduce the total sum of maintenance expenses (direct and indirect),
- Monitors world accomplishments in the terotechnology area,
- Permanent specialization and the application of contemporary accomplishments in the maintenance area in the Coal Mines Banovići
- He is responsible to the executive director for technical affairs and the union director

Employer

Coal Mines "Banovići", joint-stock company Banovići

Type of company

Production and sale of coal

Education and specialization

Dates

Graduated eight-year-long primary school in Banovići Selo in 1971

Graduated the Mechanical-technical School in Banovići in 1974

Graduated Faculty of Mechanical Engineering, course Production Engineering in Sarajevo in 1978,

Graduated post-graduate studies, department Energetic Engineering, course Production Management in the Faculty of Electrical Engineering in Tuzla in 1997,

Completed his master thesis, theme "The Impact of the Maintenance Strategy on the Enlargement of the System Efficacy in the Coal Exploitation in the Open Pit Čubrić" in the Faculty of Electrical Engineering in Tuzla on 27 June 1997

Completed his doctor theses, theme "Contribution of the Computer Algorithm Preference on the Maintenance of Complex Technical Systems" on 14 December 2001

Passed his profession test for the completion of technical management in mining in front of the testing board of the Republican Committee for Energy sources and industry – Sarajevo (certificate number: 11-153-132/80 on 16 February 1981)

Completed an English course for the duration of 70 classes. The course was realized according to the Programme of the School of Foreign Languages in Zagreb (certificate number: 01/86/85 on 9 April 1985)

Participated in the second Yugoslav seminar on connecting and maintaining transport assemblies from 19 to 21 November 1984, which was held at the Institute for Mining Researches in Tuzla (certificate of attending the seminar from 21 November 1984)

CERTIFICATE of Achievement awarded to Hasan Avdić for successfully completing the Cummins Engine Company, LTD training course entitled (K engine and PT fuel system – Date 8-12 May 1989)

Attended the seminar "Application of statistical methods in production and research organized by the Faculty of Mechanical Engineering, Zenica on 25 April 1998 (certificate from 25 April 1998)

CERTIFICATE – It is certified that Hasan Avdić, University of Tuzla, Faculty of Mechanical Engineering Bosnia and Herzegovina, has participated/presented a paper in the above named symposium that was organized by UNIVERSITY OF BIHAĆ, FACULTY OF TECHNICAL ENGINEERING BIHAĆ, BOSNIA AND HERZEGOVINA (September, 27-29, 2001)

CERTIFICATE – It is certified that Hasan Avdić successfully attended the course "Fracture Mechanics" which held the honourable DR SC Ružica Nikolić, full-time professor (Tuzla, 18 July 2002)

CERTIFICATE – awarded to Hasan Avdić in recognition of participation in the 8th Summer University Tuzla 2003, and his successful attendance at the course "Intelligent transport systems" and "Transports in transitional conditions: in the case of Bosnia and Herzegovina" which held the honourable Dr Mirsad Kulović, Nashville, USA (Tuzla, July 2003)

Successfully completed "Tribology Seminar" held in Samobor from 11 to 14 November 2003, organised by the company Fuchs Maziva d.o.o (Samobor, 14 November 2003)

CERTIFICATE – awarded to Hasan Avdić in recognition of participation and valuable contributions to the 4th INTERNATIONAL SCIENTIFIC CONFERENCE ON PRODUCTION ENGINEERING DEVELOPMENT AND MODERNIZATION OF PRODUCTION, Theme: "FACTOR METHOD APPLICATION FOR TIME ANALYSIS AND MAINTAINABILITY OF COMPLEX TECHNICAL SYSTEMS", Bihać, Bosnia and Herzegovina, September 25-27, 2003

CERTIFICATE – awarded to Hasan Avdić in recognition of participation and valuable contributions to the 5th INTERNATIONAL SCIENTIFIC CONFERENCE ON PRODUCTION ENGINEERING DEVELOPMENT AND MODERNIZATION OF PRODUCTION, Theme: "DIAGNOSIS OF STEAM BOILERS CONDITION BY APPLYING CERTAIN DIAGNOSTIC METHODS", Bihać, Bosnia and Herzegovina, September 14-17, 2005

Acquired qualification	VII/2, Doctor of technical studies in the field of mechanical engineering
Scientific and vocational field, acquired titles and skills	Technical studies, mechanical engineering, narrower scientific field Terotechnology In the academic year 1996/97 worked as an assistant, subject Transport systems in the Faculty of Electrical and Mechanical Engineering in Tuzla, Became research fellow with the title Senior assistant, subject Transport systems in the Faculty of Electrical and Mechanical Engineering in Tuzla, department of energetic mechanical engineering on 26 November 1997 (decision number 01-1-825/97 from the 26 November 1997) Became the scientific-teaching title of Docent (decision number 03-3520-3.7/02. from 18 July 2002) of the narrower scientific field Terotechnology in the Faculty of Mechanical Engineering Tuzla Became the scientific-teaching title of associate professor (decision number 03-1700-8.23/08 from 19 March 2008) of the narrower scientific field Terotechnology in the Faculty of Mechanical Engineering Tuzla
Name and type of organisation	University of Tuzla, Faculty of Mechanical Engineering

**Scientific works in the
framework of formal
education**

Title of work	"The efficacy analysis of complex technical systems" , Collection of papers, (485-490), 2 nd International congress Revitalization and modernization of production, Bihać, 1999 ISBN 9958-624-063-0 COBISS/BiH-ID 672691B
Institution in which the work was completed	Coal Mines "Banovići", joint-stock company Banovići
Place and year	Banovići, 1999
Short summary	<i>The system of coal exploitation in the open pits in the Coal Mines Banovići is very complex and works in very unfavourable conditions. On the ground of the time conditions, the components of the efficacy function (operative efficiency, reliability and the functional suitability), as well as the bare efficacy were calculated. Having the calculated parameters, the analysis of the efficacy system for the exploitation of coal was carried out.</i>
Comments	Author: Avdić H.
Title of work	"Contribution to the suitability analysis of the maintenance of complex technical systems " , Collection of papers, (491-496), 2 nd International congress Revitalization and modernization of production, Bihać, 1999 ISBN 9958-624-063-0 COBISS/BiH-ID 672691B
Institution in which the work was completed	Indicate key publications and presentations for the title, status and the determined competences Coal Mines "Banovići", joint-stock company Banovići
Place and year	Banovići, 1999
Short summary	<i>The maintenance suitability is the internal characteristic of the system which has been incorporated into the system. The available literature does not elaborate the qualitative or the quantitative term of the maintenance suitability. However, the maintenance suitability of complex technical system can be evaluated by using one of the following criteria: duration of the activity, the expense principle or the capacity principle. This work analyses some maintenance suitability elements and the favourable typical expression of those complex technical systems.</i>
Comments	Author: Avdić H.
Title of work	"The impact of the maintenance suitability on the system reliability " , Collection of papers, (189-196), 6 th International conference, Maintenance 2000, Opatija, 2000 UDK 658.58 (063) ISBN 953-97615-2-2
Institution in which the work was completed	University of Tuzla, Faculty of Mechanical Engineering
Place and year	Tuzla, 2000
Short summary	<i>The maintenance suitability is the internal characteristic of the system which is connected to an easy, exact, safe and economical maintenance performance, aimed at securing certain functional performances. The downtime of technical systems presents the basis for calculating the maintenance suitability. The reliability characteristics as well as the maintenance suitability of the system define the operative efficiency or the operative availability and influence in this way the system effectiveness in performing a specific task. This work analyses the impact of the maintenance suitability on reliability in the view of time condition.</i>
Comments	Authors: Avdić H. , Tufekčić Dž., Šelo R.:

Title of work	"The impact of the maintenance suitability on the operative efficiency" , Collection of papers, (471-478), 5 th International scientific-professional congress, Developmental tendencies of mechanical constructions and technologies, TMT 2000, Zenica, 2000 ISBN 9958-617-06-4 COBISS/BiH-ID 8198918
Institution in which the work was completed	University of Tuzla, Faculty of Mechanical Engineering
Place and year	Tuzla, 2000
Short summary	<i>The downtime of technical systems presents the basis for calculating the maintenance suitability. The reliability characteristics as well as the maintenance suitability of the system define the operative efficiency or the operative availability and influence in this way the system effectiveness in performing a specific task. The impact of the maintenance suitability on the operative efficiency was analysed in view of the time condition.</i>
Comments	Authors: Avdić H. , Tufekčić Dž., Šelo R.
Title of work	"The review of maintenance suitability of complex technical systems" , Collection of papers, (475-480), 3 rd International congress, Revitalization and modernization of production, 27-29 September, Bihać, 2001, ISBN 9958-624-10-9 COBISS/BiH-ID 970752
Institution in which the work was completed	Coal Mines "Banovići", joint-stock company Banovići
Place and year	Banovići, 2001
Short summary	<i>The review of maintenance suitability defines the liquidity of the maintenance suitability of technical systems. The environmental conditions are known and assumed. This work analyses the maintenance suitability review of technical system according to a normal distribution, as well as the ABC analysis of the downtime impact on the maintenance suitability.</i>
Comments	Authors: Avdić H. , Tufekčić Dž.
Title of work	"Contribution to the analysis of the functional suitability of complex technical systems " , Collection of papers, (356-361), 4 th International scientific-professional congress, October 1998, Zenica Indicate key publications and presentations for the title, status and the determined competences
Institution in which the work was completed	University of Tuzla, Faculty of Mechanical Engineering
Place and year	Tuzla, 1998
Short summary	<i>The exploitation system of mineral materials in the open pit Čubrić consists of four high-productive excavators. As a subsystem, excavators have a highly complex structure and hard conditions of work, including those climate ones, as well as geomechanical and hydrological ones. The functional suitability was analysed by monitoring the effective working hours of the excavator. Individual subsystems of the exploitation system of coal have a different functional suitability.</i>
Comments	Autori: Avdić H. , Tufekčić Dž., Brdarević S.
Title of work	"The impact of the research suitability and diagnostics on the maintenance suitability of complex technical systems " , Collection of papers– CIM 2002, (V – 001), 8 th International Scientific Congress of Manufacturing Engineering CIM – 2002 (Computer Integrated Manufacturing and High Speed Machining), 13-14 June , Brijuni, 2002, Croatia UDK 621 (063) ISBN 953-97181-4-7

658.52.011.56(063)

- Institution in which the work was completed
University of Tuzla, Faculty of Mechanical Engineering
- Place and year
Tuzla, 2002
- Short summary
The maintenance suitability as the internal characteristic of the system depends largely on the diagnostic condition and the suitability analysis. The suitability analysis presents a device (system or elements) which characterizes the possibility of analysis and control of the device in the process of conditional diagnostics. The basic form of analysis and control is the control of the technical condition. This work presents the analysis of the impact of the research suitability diagnostics on the maintenance suitability.
- Comments
Authors: **Avdić H.**, Šelo R., Tufekčić Dž., Topčić A.
- Title of work
"Optimization of a Planned Overhauling", Proceedings, (647 – 650), 6th International Research/Expert Conference "Trends in the Development of Machinery and Associated Technology" TMT 2002, 18-22 September, Neum, 2002, Bosnia and Herzegovina
ISBN 9958-617-11-0 **COBISS/BiH-ID 11145990**
- Institution in which the work was completed
University of Tuzla, Faculty of Mechanical Engineering
- Place and year
Tuzla, 2002
- Short summary
The usage of high-weight dumpers for the transport of waste-rock in the open pits in Bosnia and Herzegovina presents a significant item in the overall manufacturing expenses of the mine in general. This work, according to the given experimental information, quantifies the reliability and availability of high-weight dumpers in the open pits and analyses the impact of the maintenance strategy on the enhancement of reliability and availability. The financial losses of the mine are defined in view of the duration of the overhaul activities. Different researches identified the causes of the long period of overhauling, analysed the possibility of applying a relevant information system in order to optimize the overhaul activities and in this way enhanced the work effectiveness of the mine in general.
- Comments
Authors: Karić A., **Avdić H.**, Hatunić O.
- Title of work
"Influence of qualitative characteristics of technical systems construction on maintainability", Proceedings, (543 – 546), 6th International Research/ Expert Conference "Trends in the Development of Machinery and Associated Technology" TMT 2002, 18-22 September, Neum, 2002, Bosnia and Herzegovina
ISBN 9958-617-11-0 **COBISS/BiH-ID 11145990**
- Institution in which the work was completed
Coal Mines "Banovići", joint-stock company Banovići
- Place and year
Banovići, 2002
- Short summary
Maintenance suitability is one constructional parameter of the system which must be analyzed carefully, together with the remaining constructional parameters. The ability of the system to be kept maintained, or put back into the operative condition, is also significant for the usefulness of the system and its ability to manage given functions reliably. Maintenance suitability implies those taken activities in the process of a system development in the purpose of its efficient maintenance. According to this, the constructional characteristics of the maintenance suitability imply those elements which contribute to the decrease in downtime and increase in availability. As a constructional characteristic of the system, the maintenance suitability engages into those system properties like the testing suitability – diagnostics, assemblage and breakup suitability, exchange suitability, suitability access for handling, etc. This work analyses the impact of those mentioned

qualitative characteristics of the system on the maintenance suitability. Applying adequate methods enables the compatibility of these times, which presents the basis for regulating construction with terotechnological aspects.

Comments Authors: **Avdić H.**, Tufekčić Dž.

Title of work **"The application of artificial neuron networks on the maintenance time analysis"**, Collection of Papers, (583 – 597), International scientific-professional congress "Condition and Developmental Prospects of coal mines in Bosnia and Herzegovina ", 26 and 27 September, Kakanj, 2002
ISBN 9958-617-12-9 **COBISS/BiH-ID 11228166**

Institution in which the work was completed Faculty of Mechanical Engineering

Place and year Tuzla, 2002

Short summary *The maintenance suitability is the internal characteristic of the system which is connected to an easy, exact, safe and economical maintenance performance aimed at securing certain functional performances. Downtime of technical systems due to maintenance presents the basis for calculating maintenance suitability. This time is connected with the time in which the system is "IN FAILURE", i.e. it does not perform the criteria function. Because of this, it is necessary to analyse the time structure, consider the impacts of specific segments of those times on the total length of downtime, in order to enhance the time in which the system is working. This work analyses the maintenance time structure by applying artificial neuron networks. By enhancing the working time of the system, we enhance the effectiveness of complex technical systems.*

Comments Authors: **Avdić H.**, Tufekčić Dž., Šelo R.:

Title of work **"The application of the regression and correlation analysis for maintenance time modelling** Proceedings – CIM 2003, (V – 001), 9th International Scientific Conference on Production Engineering CIM – 2003 (Computer Integrated Manufacturing and High Speed Matching), June 5 – 6, Lumbarda, Korčula, 2003, Croatia
UDK 621 (063) **ISBN 953-97181-5-5**
658.52.011.56(063)

Institution in which the work was completed University of Tuzla

Place and year Tuzla, 2003

Short summary *Modelling presents the mathematical description of the change in process parameters or systems in a specific time and space. The basic aim of the mathematical modelling is defining the legality of correlations between input (primary) and output (secondary) parameters. Downtimes of technical systems due to maintenance are important for the research of maintenance suitability. This time is connected with the time in which the system is in failure, i.e. it does not perform the criteria function. As a constructional characteristic of the system, the maintenance suitability engages into those system properties like the testing suitability – diagnostics, assemblage and breakup suitability, exchange suitability, suitability access for handling, etc. This work analyses the maintenance time modelling by applying the regression and correlation analysis.*

Comments Authors: **Avdić H.**, Karić A., Tufekčić Dž.

Title of work	<p>"Vibration influence on operational status of complex technical systems", Proceedings 2nd DAAAM International Conference on Advanced Technologies for Developing Countries – ATDC 03, (375 – 380), June 25-28, Tuzla, 2003, Bosnia and Herzegovina</p> <p style="text-align: right;">ISBN 9958-609-14-2 COBISS.BH-ID 12031238</p>
Institution in which the work was completed	University of Tuzla
Place and year	Tuzla, 2003
Short summary	<p><i>In the process of coal exploitation, Coal Mines Banovići apply some complex technical systems of very high capacity which enable the achievement of high capacity on the mineral material. Because of the high expenses as well as their productive effect, those technical systems demand an impeccable maintenance. Effective maintaining means by using interventions to reduce the number and duration of downtime. If we analyse the time duration, we can conclude that there is much impact on the appearance and duration of downtime and the accuracy condition of technical system. This work presents the vibration influence on the operational status of complex technical systems.</i></p>
Short summary	Authors: Avdić H. , Tufekčić Dž., Karić A.
Title of work	<p>"Cluster Method Application for Analyzing Time and Maintainability in Complex Technical Systems", Proceedings, (997 – 1000), 7th International Research/Expert Conference "Trends in the Development of Machinery and Associated Technology" TMT 2003, Lloret de Mar, Barcelona, Spain, 15-16 September, 2003.,</p> <p style="text-align: right;">ISBN 9958-617-18-8 COBISS.BH-ID 12274950</p>
Institution in which the work was completed	Faculty of Mechanical Engineering, Tuzla
Place and year	Tuzla, 2003
Short summary	<p><i>The maintenance suitability is the internal characteristic of the system which is connected to an easy, exact, safe and economical maintenance performance aimed at securing certain functional performances. Maintenance suitability includes those activities which are taken while developing a system in order to effectively maintain it. According to this, the constructional characteristics of the maintenance suitability imply those elements which contribute to the decrease in downtime and increase in the availability. On the other hand, downtime of technical systems due to maintenance is of vital importance for the research of maintenance suitability. As a constructional characteristic of the system, the maintenance suitability engages into those system properties like the testing suitability – diagnostics, assemblage and breakup suitability, exchange suitability, suitability access for handling, etc. This work presents the CLUSTER analysis of the mentioned qualitative constructional characteristics on time and maintenance suitability.</i></p>
Comments	Authors: Avdić H. , Šelo R., Tufekčić Dž.
Title of work	<p>"The application of the factor method for time analysis and maintenance suitability of complex technical systems", Proceedings, (355 – 360), 4th International Scientific Conference on Production Engineering (DEVELOPMENT AND MODERNIZATION OF PRODUCTION – RIM 2003), Bihać, Bosnia and Herzegovina, 25.-27. September 2003</p>

Indicate key publications and presentations for the title, status and the determined competences

Institution in which the work was completed
 Faculty of Mechanical Engineering, Tuzla

Place and year
 Tuzla, 2003

Short summary
The maintenance suitability is the internal characteristic of the system which is connected to an easy, exact, safe and economical maintenance performance aimed at securing certain functional performances. Maintenance suitability includes those activities which are taken while developing a system in order to effectively maintain it. According to this the constructional characteristics of the maintenance suitability imply those elements which contribute to the decrease of downtime and increase the availability. On the other hand, downtime of technical systems due to maintenance is of vital importance for the research of maintenance suitability. As a constructional characteristic of the system, the maintenance suitability engages into those system properties like the testing suitability – diagnostics, assemblage and breakup suitability, exchange suitability, suitability access for handling, etc. This work analyses the factor method of the impact of the mentioned qualitative constructional characteristics on time and maintenance suitability.

Comments
 Authors: **Avdić H.**, Tufekčić Dž., Šelo R.

Title of work
"Diagnosis of Tribology Technical Conditions on CUMMINS Diesel Engines KTA 50 C ", Proceedings, (671 – 674), 8th International Research/Expert Conference "Trends in the Development of Machinery and Associated Technology" TMT 2004, Neum, Bosnia and Herzegovina 15-19 September, 2004.,

ISBN 9958-617-21-8

COBISS.BH-ID 13360134

Institution in which the work was completed
 Coal Mines "Banovići", joint-stock company Banovići

Place and year
 Banovići, 2004

Short summary
While exploiting mineral materials, Coal Mines Banovići use high-weight dumpers of 1700 [kN]. Engines CUMMINS-50 C, power 1194 KW by 1900 [r/min] which are used for the drive of those trucks. The replacement of oil is done after completing 250 working hours. Considering the expensive trucks and the engines, it is necessary to overlook constantly the oil condition in order to secure a longer period of replacing the oil and defining the technical condition of the tribological system and the beforehand maintenance actions. This work presents the diagnosis of the tribology technical conditions of the engines based on the diagnosis of the motor oil.

Comments
 Autori: **Avdić H.**, Tufekčić Dž.

Title of work
"The parameters analysis of the rail transport by applying software packages", Collection of Papers, (189 – 104), International scientific-professional congress IRMES 04- Research and development of mechanical elements and systems, Kragujevac, Serbia and Montenegro, 16th and 17th September, 2004.

ISBN 86-80581-66-6

Institution in which the work was completed
 University of Tuzla

Place and year
 Tuzla, 2004

Short summary
The construction process is often linked to long-time and often hard procedures of electing and optimizing specific product segments. Informational technologies, having experiences an expansion in the last twenty years, present a powerful method in the construction process, development and

optimization. This work presents one example of the usage of a software package 5.3 as a method of optimizing constructional and working parameters of the rail transport.

Comments	Authors: Topčić A, Šelo R., Tufekčić Dž, Avdić H.
Title of work	"Lubrication process control of the equipment in Coal mine Banovići" Proceedings of the Conference on Fuels, Tribology and Ecology, (49 – 56), SLOTTRIB 04, Radenci, Slovenija, 11 – 12 November 2004 ISBN 961-90254-6-6
Institution in which the work was completed	Coal Mines "Banovići", joint-stock company Banovići
Place and year	Banovići, 2004
Short summary	<i>While exploiting mineral materials, Coal Mines Banovići apply mining machines and devices of high capacity which enable the achievement of high capacity on the mineral material. Downtimes of all machines cause downtimes in the production. Therefore, the maintenance problem of those machines has to be handled very carefully. The total sum of maintenance expenses (direct and indirect) is very high. A significant part in the overall maintenance expenses takes the lubrication expenses. The total sum of lubricants in 2003 was 800 000 Euros. This work presents the present way of dealing with the lubrication process and a suggestion of a new management in order to reduce the total expenses and to contribute to a qualitative lubrication of equipment in the Coal Mines Banovići.</i>
Comments	Authors: Avdić H. , Tufekčić Dž.
Title of work	"Diagnosis of the condition of Flexible Production Systems Condition" , Proceedings, (413 – 416), 9 th International Research / Expert Conference "Trends in the Development of Machinery and Associated Technology" TMT 2005, 26-30 September, Antalya, 2005, Turkey., ISBN 9958-617-28-5 COBISS.BH-ID 14361094
Institution in which the work was completed	Faculty of Mechanical Engineering
Place and year	Tuzla, 2005
Short summary	<i>The diagnosis of the condition of technical systems presents a research process of the diagnosis of the object, investigation of the research results and a research forecast of the technical system in the future. The development and construction of the Flexible Production Systems (FPS), as the highest level of the integral management of performance processes, has to follow the development of the diagnostic hardware and software. Diagnosis issues of all FPS can be viewed through two basic integrated approaches: the diagnosis of the machining process and the overall hardware and software diagnosis. This work presents the algorithm of the activities by diagnosing the condition of FPS. The emphasis is put on the application of suitable diagnostic methods.</i>
Comments	Authors: Avdić H. , Tufekčić Dž., Trakić E.:
Title of work	"Vibration influence on the condition of hoist mechanism excavator MARION 201 M" , Proceedings – MAINTENANCE 2006, (257 – 266), 12. International Conference, MAINTENANCE 2006, (HDO), 16 – 18 May, Rovinj 2006, Croatia UDK 658.58 (063) ISBN 953-97615-8-1
Institution in which the work was completed	Coal Mines "Banovići", joint-stock company Banovići

Place and year	Banovići, 2006
Short summary	<i>In general, mechanical vibrations can be described as oscillated movements of a rigid object by comparison with its balanced posture. The cause of this movement is the disturbed compulsive force (compulsive vibrations) which can be determined or accidental. Free vibrations present periodical movement which the object performs while the compulsive force leaves out. The Coal Mines Banovići exploit coal according to a designed technology, being constantly improved. On the basis of the technological development, occurs the increase in capacity in accordance with the market demands. The Coal Mines Banovići apply a discontinuous (periodical) system of surface exploitation (drills-excavators-dumper trucks in the manufacturing process "WASTE-ROCK" and drills-excavators-dumper trucks- conveyor belts-railway wagons- the separation of coal in the manufacturing "THE OBTAINING OF MINERAL MATERIALS – COAL") This work presents the impact of vibrations on the accuracy of the hoist mechanism excavator MARION 201 M.</i>
Comments	Authors: Avdić H. , Tufekčić Dž., Jakubec K.
Title of work	"Determination of tribology assemblies condition of a Cummins diesel engine KTA – 50 C" , Proceedings of the Conference on Fuels, Tribology and Ecology, (161 – 167), SLOTRIB 06, Ljubljana, Slovenia, 14 N November 2006 ISBN 10 961-90254-7-4 ISBN 13 978-961-90254-7-5
Institution in which the work was completed	Coal Mines Banovići, joint-stock company Banovići
Place and year	Banovići, 2006
Short summary	<i>While exploiting mineral materials, Coal Mines Banovići use high-weight dumpers of 1700 [kN]. Engines CUMMINS-50 C, power 1194 KW by 1900 [r/min] which are used for the drive of those trucks. The replacement of oil is done after completing 250 working hours. Considering the expensive trucks and the engines, it is necessary to overlook constantly the oil condition in order to secure a longer period of replacing the oil and defining the technical condition of the tribological system and the beforehand maintenance actions. This work presents the diagnosis of the tribology technical conditions of the engines based on the diagnosis of the motor oil.</i>
Comments	Authors: Avdić H. , Ivaniš D., Karić A.
Title of work	"Contribution to the availability analysis of complex technical systems " , Collection of Papers - MAINTENANCE 2007, (143 – 150), 13 TH INTERNATIONAL CONFERENCE HDO, MAINTENANCE 2007, 15 – 17 May, Šibenik 2007, Croatia ISBN-13 978-953-97615-9-0 ISBN-10 953-97615-9-X
Institution in which the work was completed	Coal Mines "Banovići", joint-stock company Banovići
Place and year	Banovići, 2007
Short summary	<i>According to the definition, availability presents the ability of the element to perform (under the emergence of reliability and maintenance suitability) the demanded function in the given time period. The term "availability" is used as one availability characteristic presenting the performance possibility in the given time or the possibility during the time interval. The ability of the element or of the system exists nevertheless of its working time or its reserve. This work presents the availability analysis according to the empirical information of the working time of complex technical systems in the Coal Mines Banovići.</i>

Comments Authors: **Avdić H.**, Tufekčić Dž.

Title of work **"Contribution to the technical diagnosis of diesel engine tribology assemblies"**, Proceedings, (241 – 248), 10th International Conference on Tribology and WORKSHOP 07, SERBIA TRIB 07, Sustainable Development in Industry by Applying Tribology Knowledge, 19 – 21 June, Kragujevac 2007, Serbia
ISBN: 978-86-86663-13-9 (MF) COBISS.SR-ID 1407572260

Institution in which the work was completed Coal Mines "Banovići", joint-stock company Banovići, Oil Refinery Modriča

Place and year Banovići, 2007

Short summary *Determining the condition of tribomechanical systems has an important part in the development of the friction, wearing and lubrication in theory and praxis. In the last time, much attention has been focused on the development of contemporary devices and methods for the condition monitoring of tribomechanical properties in the systems. In order to identify the diagnosis of wearing, different physical-chemical methods were used. Experiences in the exploitation of technical systems and mechanisms have shown that the breakdown forecast is more efficient by means of parameters which are reliable indicators of the wearing process – particles which appear by wearing. An oil sample analysis which contains particles appeared by wearing, enables the condition evaluation of the tribological properties in the early phases. This work presents the experimental research results carried out on the equipment (diesel engines in dumper trucks) in the Coal Mines Banovići and the oil sample laboratory analysis carried out in the Oil Refinery Modriča.*

Comments Authors: **Avdić H.**, Dugić P., Karić A.

Title of work **"Contribution to the Mathematical Modelling of maintenance suitability of Complex Technical Systems Maintainability"**, Proceedings, (503 – 506), 11th International Research / Expert Conference "Trends in the Development of Machinery and Associated Technologies" TMT 2007, Hammamet, Tunisia, 5 – 9 September 2007
ISBN 978-9958-617-34-8 COBISS.BH-ID 15903494

Institution in which the work was completed Faculty of Mechanical Engineering, Tuzla

Place and year Tuzla, 2007

Short summary *Maintenance suitability can be presented as the possibility of the system to be put back or kept in the functional state under the prescribed conditions in the given time period, only if the maintenance is performed in accordance with the prescribed methods. This is the internal technical system characteristic connected to an easy, safe and economical performance of maintenance activities, securing specific functional parameters. Taking into account downtime due to maintenance as the basis for the maintenance suitability analysis, this work presents the mathematical model of calculating this property on the example of the*

equipment of the Coal Mines Banovići.

Comments Autori: **Avdić H.**, Tufekčić Dž., Šelo R.

Chosen publications and presentations

Title of the publication Indicate key publications and presentations for the title, status and the determined competences
Authors
Publisher, year and place
Short summary
Comments

Scientific works in the framework of formal education

Title of work **"Calculating the operative system efficiency for the exploitation of coal in the open pit Čubrić, according to the time state "**, Mechanical Engineering 4 (1997), 177-186, Zenica, 1997
ISSN 1512 – 5173
Institution in which the work was completed Coal Mines "Banovići", joint-stock company Banovići
Place and year Banovići, 1997
Short summary *This work presents a simple way of calculating the operative efficiency of an excavator and the system for coal exploitation, using computer technology on the basis of the time state. An ABC analysis of the failure duration and failure causes of excavators with a periodic working process was done.*
Authors **Avdić H.**, Tufekčić Dž.
Title of work **"Reliability of the system for exploitation of coal in the function of the time state image"**, Collection of Papers, (497-503), 5th International Design Conference Desing 98, Dubrovnik, 1998
Institution in which the work was completed Faculty of Mechanical Engineering
Place and year Tuzla, 1998
Short summary *The system for coal exploitation in the open pits works in very unfavourable conditions. According to the time state image, the system reliability was analysed. Individual subsystems of the system for exploitation of coal have different reliability. By analysing the failures of the subsystem elements, it was possible to determine priorities in the maintenance, to reduce the "Failure Time" and to enhance the system reliability and efficiency.*
Authors Tufekčić Dž., **Avdić H.**, Muratović P.

- Title of work **"Structural analysis of the maintenance time of complex technical systems "**, Collection of Papers – MAINTENANCE 2002, (163 – 171), 8th International Conference HDO, Maintenance 2002, 26-28 June, Opatija 2002, Croatia
UDK 658.58 (063) ISBN 953-97615-4-9
- Institution in which the work was completed Coal Mines "Banovići", joint-stock company Banovići
Place and year Banovići, 2002
Short summary *The downtime of technical systems due to maintenance is of crucial importance in the maintenance suitability research. This time is connected to the time in which the system is in "FAILURE", i.e. it does not perform the functional criteria. Therefore, it is necessary to analyse the structure of this time in order to see the impact of individual segments of this time on the maintenance suitability, with the main aim to enhance the "WORKING TIME". This work analyses the maintenance time by applying adequate methods. The enhancement of the WORKING TIME results in the enhancement of the complex technical systems efficiency.*
- Authors **Avdić H., Tufekčić Dž.**
- Title of work **"Justification of the technical diagnostics introduction in the Coal Mines Banovići– "Banovići""**, Collection of Papers - MAINTENANCE 2003, (65 – 74), 9TH International Conference HDO, Maintenance 2003, 26-28 May, Opatija 2003, Croatia
UDK 658.58 (063) ISBN 953-97615-5-7
- Institution in which the work was completed Coal Mines "Banovići", joint-stock company Banovići
Place and year Banovići, 2003
Short summary *While exploiting mineral materials, Coal Mines Banovići apply mining machines and devices of high capacity which enable the achievement of high capacity on the mineral material. Downtimes of all machines cause downtimes in the production. Therefore, the maintenance problem of those machines has to be handled very carefully. The Coal Mines Banovići use one combined strategy of planned-preventive maintaining. The aim of introducing a maintenance strategy by condition is the introduction of technical diagnostics.*
- Authors **Avdić H., Tufekčić Dž.**
- Title of work **"Condition diagnostics of high-productive systems in mining"**, Collection of Papers - MAINTENANCE 2004, (167 –174), 10th International Conference HDO, MAINTENANCE 2004, 17-19 May Opatija 2004, Croatia
UDK 658.58 (063) ISBN 953-97615-6-5
- Institution in which the work was completed Coal Mines "Banovići", joint-stock company Banovići
Place and year Banovići, 2004
Short summary *In the process of coal exploitation, Coal Mines Banovići apply some complex technical systems of very high capacity, which enable the achievement of high capacity on the mineral material. Because of the high*

expenses as well as their productive effect, those technical systems demand an impeccable maintenance. Effective maintaining means by using interventions to reduce the number and duration of downtime. This is possible only by applying contemporary diagnostics methods and diagnostic equipment in order to diagnose the condition. This work presents the diagnostics of the state of one system by applying contemporary devices for vibration measurement, gathering, processing and analysing the measured values.

Authors **Avdić H.**, Tufekčić Dž., Demirović A.

Title of work **"Application of the shock pulse method (The Shock Pulse Method) by determining the condition of rolling bearings "**, Collection of Papers - MAINTENANCE 2005, (247 – 256), 11th International Conference HDO, MAINTENANCE 2005, 16-18 May, Šibenik 2005, Croatia

UDK 658.58 (063) ISBN 953-97615-7-3

Institution in which the work was completed Banovići joint-stock company Banovići

Place and year Banovići, 2005

Short summary *According to the gathered experience, it can easily be concluded that the duration of a rolling bearing is unpredictable. The failure possibilities of this element are very high. Analyses have shown that the possible deviations are twenty times higher than the duration which was theoretically presented. The most famous and reliable method of following the condition of a rolling bearing is the shock pulse method or the SPM method (The Shock Pulse Method). This work explains this method theoretically with one practical application example in the Coal Mines Banovići.*

Authors **Avdić H.**, Jakubec K., Tufekčić Dž.

Title of work **"Organization of the technical diagnosis department in Coal Mines-Banovići"**, Proceedings – CIM 2005, (V – 1), 10th International Scientific Conference on Production Engineering CIM 2005 (Computer Integrated Manufacturing and Speed Machining), June 15 – 17, Lumbarda, Korčula, 2005, Croatia.

UDK 621 (063) ISBN 953-97181-6-3
658.52.011.56(063)

Institution in which the work was completed Coal Mines "Banovići", joint-stock company Banovići

Place and year Banovići, 2005

Short summary *The diagnosis of the condition of technical systems presents a research process of the diagnosis of the object, investigation of the research results and a research forecast of the technical system in the future. According to the condition, maintenance with the application of technical diagnostics and contemporary diagnostic equipment uses a lot of information and data. The demands in the section of data processing and analysing are enhanced in order to secure an in time undertaking of maintenance activities. There is a necessity to build up a unit (diagnostic centre) for the diagnostics of the condition of technical systems (in the company) and the improvement of its organisational structure. This work presents the present organisational structure of maintenance in the Coal Mines Banovići with the suggestion to*

build up a new organisation with the setting up of a diagnostic centre.

Authors **Avdić H., Tufekčić Dž.**

Title of work **"Diagnosis of steam boilers condition by applying certain diagnostic methods"**, Proceedings, (455 – 458), 5th International Scientific Conference on Production Engineering (DEVELOPMENT AND MODERNIZATION OF PRODUCTION – RIM 2005), 14-17 September, Bihać, 2005, Bosnia and Herzegovina.

ISBN 99589262-0-2

COBISS.BH-ID 14365190

Institution in which the work was completed

Faculty of Mechanical Engineering

Place and year

Tuzla, 2005

Short summary

Exploitation experiences have shown that most technical systems do not lose their functional characteristics at once, but continuously. Damages, conditions "IN FAILURE" and breakdowns are consequences of the easy wearing during exploitation. A wearing hint of the condition "IN FAILURE" or breakdown appears much earlier. It was necessary to develop adequate methods, proceedings and equipment for the calculation of the condition parameters of the technical system, which indicate a dysfunction and the expected appearance of damages of the condition "IN FAILURE". To identify the damage degree of steam boilers, we use the dissection research method. This work presents the algorithm of activities by condition diagnostics of steam boilers, emphasising the application of suitably diagnostic methods.

Authors **Avdić H., Tufekčić Dž., Mujkić M.**

Title of work **"Managing the lubrication process of CUMMINS engine KTA 50-C in Coal Mines Banovići"**, 38th Scientific-profession symposium – LUBRICANTS 2005, 19-21 October, Rovinj, 2005, Croatia.

ISSN 0350-350X

UDK 621+66(5)=861/6

Institution in which the work was completed

Coal Mines "Banovići", joint-stock company Banovići, Patting Varaždin

Place and year

Banovići, 2005

Short summary

In the process of coal exploitation, Coal Mines Banović apply some complex technical systems of very high capacity which enable the achievement of high capacity on the mineral material. Because of the high expenses as well as their productive effect, those technical systems demand an impeccable maintenance. Effective maintaining means to reduce the number and duration of downtime by using interventions. While exploiting mineral materials, Coal Mines Banovići use high-weight dumpers of 1700 [KN]. Engines CUMMINS-50 C, power 1194 KW by 1900 [°/min] which are used for the drive of those trucks. The replacement of oil is done after completing 250 working hours. Considering the expensive trucks and the engines, it is necessary to overlook constantly the oil condition in order to secure a longer period of replacing the oil and defining the technical condition of the tribological system and the beforehand maintenance actions. This work presents the present lubrication management process of CUMMINS engines, in order to reduce the overall maintenance expenses and to secure a qualitative lubrication of

engines.

Authors **Avdić H., Ivaniš D., Tufekčić Dž.**

Chosen projects and presentations

Title	"ELABORATION on the justification of purchase of new dumper trucks or the start-up of existing dumper trucks which are not used " , Indicate key publications and presentations for the title, status and the determined competences
Authors	Šarić B., Avdić H. , and associates
Publisher, place and year	Coal Mines "Banovići" in Banovići, joint-stock company Banovići, 2003, (Decision number: 658/2003 from 11 June 2003)
Short summary	Within the elaboration, the following was done: -observation of the existing availability condition of dumper trucks, - consideration of necessity for dumper trucks according to the annual plan, -demand analysis for dumper trucks according to the restructuring programme of the mine for 2003-2008, It was also worked out whether it is justified to start-up the existing dumper trucks which are not used, -within the elaboration, the following was done: the justification of purchase of new dumper trucks, and -within the elaboration, the following was done: the justification of purchase of certain new dumper trucks with the additional start-up of existing dumper trucks which are not used.
Comments	
Title	"ELABORATION – A suggestion for an equipment investment in the Coal mines – Banovići",
Authors	Avdić H.:
Publisher, place and year	Banovići, 2004
Short summary	Within the elaboration, the following was done: -condition analysis of the equipment accuracy in the Coal Mines Banovići, - analysis of investments in the equipment in an earlier period, -a suggestion for an equipment investment in the coming period.
Comments	
Title	"ELABORATION – on the techno-economical justification of purchase of dumper trucks in the Coal Mines Banovići",
Authors	Halilbegović V., Avdić H. , and associates
Publisher, place and year	Banovići, 2005, (Decision number: 27 – 01/04 from 10 January2005)
Short summary	Within the elaboration, the following was done: - condition analysis of the dumper trucks accuracy, -analysis of the dumper trucks availability, - demand analysis for dumper trucks according to the annual plan and the restructuring programme of the mine, -analysis of the coal placement, - analysis of investments in dumper trucks in an earlier period, -analysis of the techno-economical investment in the setup of existing dumper trucks which are not

	used,
	-analysis of the techno-economical justification of purchase of new dumper trucks, taking into account the investments into the maintenance of the existing number of trucks,
	-the necessary capacity of dumper trucks was defined according to the technical-technological analysis.
Comments	
Title	“ELABORATION – on the techno-economical justification of purchase of a hydraulic shovel excavator in the Coal mines– Banovići” ,
Authors	Halilbegović V., Avdić H. , and associates
Publisher, place and year	Banovići, 2005, (Decision number: 1571/04 from 04 February 2004)
Short summary	Within the elaboration, the following was done: - condition analysis of the excavator accuracy, - analysis of the excavator availability, - demand analysis for excavators according to the annual plan and the restructuring programme of the mine, -analysis of the coal placement, - analysis of investments in excavators in an earlier period, - analysis of the techno-economical justification of purchase of new excavators, taking into account the environment protection and the elimination of seismic powers during blasts -the necessary volume capacity of the hydraulic shovel excavator was defined according to the technical-technological analysis.
Comments	
Title	“ELABORATION – on the techno-economical justification of purchase of two dumper trucks” ,
Authors	Halilbegović V., Avdić H. , and associates
Publisher, place and year	Banovići, 2006, (Decision number: 5911/06 from 14 June 2006)
Short summary	Within the elaboration, the following was done: - condition analysis of the dumper trucks accuracy, -analysis of the dumper trucks availability, - demand analysis for dumper trucks according to the annual plan and the restructuring programme of the mine, -analysis of the coal placement, - analysis of investments in dumper trucks in an earlier period, -analysis of the techno-economical justification of purchase of new dumper trucks, -the necessary capacity of dumper trucks was defined according to the technical-technological analysis.
Comments	
Nazi	“ELABORATION on the rehabilitation steps of the excavator MARION-201 M, of the Coal Mines “BANOVIĆI”
Authors	Šelo R., Avdić H. , and associates
Publisher, place and year	Tuzla, 2003, (Contract number: 06/6 – 111- 03/02 from 18 November 2002)
Short summary	Within the elaboration, the following was done: -the technical system was defined, -the subsystem for diagnostics was defined, -analysis of the previous mode of vibration measurements (genesis of events),

-the measurement of vibrations with a new device type Picolog CMVL 10 was carried out
-a results analysis was carried out, and a new way for problem solving of an increased vibration level on the hoist mechanism was suggested.

Comments

Title **“ELABORATION – analysis workout and the activation project of the conveying system for waste-rock in the open pits in the Coal Mines”,**

Authors Golać H., **Avdić H.**, and associates

Publisher, place and year Banovići, 2005, (Decision number: 1875/05 from 25. 01. 2005)

Short summary Within the analysis drawing up and the project, the following was done:

- analysis of the purchased equipment,
- defining requirements for the purchase of the lacking equipment,
- analysis of investing into the setup of existing equipment and purchase of lacking equipment,
- analysis of the techno-economical justification of investments into the activation project of the conveying system,
- according to the techno-economical optimization study and the excavation order in some open pits of the Coal Mines Banovići and the remaining documents connected to this domain, an open pit where to activate the first conveying system was suggested,
- according to the above-mentioned, a project for the introduction of a conveying system for waste-rock in the open pits in the Coal Mines Banovići was drawn up.

Comments

Title **“ELABORATION – on monitoring and realization of Planned activities in the Coal Mines Banovići – joint-stock company Banovići, carrying out the Activities on restructuring and modernization of the Coal Mines in the Federation of Bosnia and Herzegovina”,**

Authors Lapandić I., **Avdić H.**, and associates

Publisher, place and year Banovići, 2005, (Decision number: 1579/05 from 04 February 2005)

Short summary While drawing up this elaboration, the task of the commission was to:

- monitor realized planned activities in the Coal Mines Banovići – joint-stock company Banovići, in the process of carrying out the Activities on restructuring of Coal Mines in the Federation of Bosnia and Herzegovina, to monitor, to guide and coordinate the work of other Commissions engaged in this process.

Comments

Title **“ELABORATION – on monitoring the consumption of spare parts according to the places of emergence – The first phase for the Mine Open Exploitation of Coal”,**

Authors **Avdić H.**, and associates

Publisher, place and year Banovići, 2006, (Decision number: 3840/06 from 25 April 2006)

Short summary Within the elaboration, the following was done:

- analysis of the existing monitoring of the consumption of spare parts according to the places of emergence
- the equipment was defined, or in other words, the place where the consumption of spare parts emerges,
- drawing up of a suggestion for a new way of monitoring the consumption of spare parts and the finishing of the existing mode,
- analysis of the organisation of the maintenance function connected to this section and a suggestion of possible changes,
- drawing up of an informational subsystem for this section – the defining of the necessary documents (the drawing up of software is not implied here),
- places for gathering, processing and analysing the acquired information were defined,
- drawing up of passwords for the equipment,
- drawing up of directions for monitoring and analysis of the consumption of spare parts.

Comments	
Title	"THE IMPLEMENTATION OF THE ELABORATION – on monitoring the consumption of spare parts according to the places of emergence - The first phase for the Mine Open Exploitation of Coal" ,
Authors	Avdić H., and associates
Publisher, place and year	Banovići, 2006, (Decision number: 10507/06 from 12 September 2006)
Short summary	Within the elaboration, the following was done: Training of the personnel for the application of the elaboration on monitoring the consumption of spare parts and consumables, in other words, the implementation and correction of the elaboration was performed.
Comments	
Title	"ELABORATION on the investment justification for the maintenance of excavators PH – 1900 internal number 8 and 9 and PH – 1900 AI internal number 11, 12 and 13" ,
Authors	Avdić H., and associates
Publisher, place and year	Banovići, 2006, (Decision number: 1150/06 from 21 November 2006)
Short summary	Within the elaboration, the following was done: - condition analysis of the excavators accuracy PH – 1900 internal number 8 and 9 and PH – 1900 AI internal number 11, 12 and 13, - condition analysis of time (information about the downtime and working time) for each individual excavator in the last three years, -according to the accuracy condition, scope and type of maintenance of those excavators was suggested, -an inventory of all spare parts for PH excavators, found in the central storage of the Coal Mine Banovići, -a specification of the necessary spare parts for the mending of each respective excavator, -an estimation of the overall mending expenses (work force, consumables, spare parts, services) for each respective excavator on the basis of 3500 working hours per year, -an expenditure proposal for some excavators mentioned in this elaboration, -through concluding considerations, the justification of a purchase was examined.
Comments	
Title	"Drafting of the project documentation for AN HYDRAULIC PERSONAL LIFT HLS-016" ,
Authors	Avdić H., Bričić A.:
Publisher, place and year	"SEMING" d.o.o., Gračanica, 2000, (Decision of the designer in charge: December 2000)
Short summary	In the framework of the project documentation, the following was done: -a complete technical-technological documentation necessary for the construction of the lift, -necessary directions and instructions (installation directions, maintenance instructions and security measures).
Comments	
Title	Simplified project: "Annual plan for 2005, Coal Mines – Banovići" ,
Authors	Avdić H. (associate)
Publisher, place and year	Banovići, 2004, (Decision number: 1148/04 from 15 October 2004)
Short summary	Within the project, the following was done: -results analysis for the past period, -analysis of the present condition of the manufacturing objects in the mine, -analysis of the equipment accuracy,

- drafting of plans (according to the segments) for 2005,
- an estimation of the possible realization of the plan.

Comments

Title	Simplified project: " Outlay of the device elements BRAGA – 6 ",
Authors	Avdić H. , Demirović A.:
Publisher, place and year	AS connector Bosnia d.o.o. Tuzla, Tuzla, 2007, (Project task, March 2007)
Short summary	In the framework of the simplified project, the following was done: <ul style="list-style-type: none"> - drawing up of an outlay (review) of welding of the cylinder bearing for locking/unlocking, - testing of screws on the cylinder bearing for locking/unlocking, - testing of the cylinder mantle for locking/unlocking, - testing of the screw strength on the cylinder lid for locking/unlocking , - drawing up of an outlay of the cylinder course for locking/unlocking, - testing of the locking force, unlocking force, as well as the testing of the segment load of the locking mechanism, - testing of the thread of the connecting rod and the cylinder lid for locking/unlocking, - testing of the load on the shafts which form the connection of rods with sidelong areas and the cylinder for locking/unlocking, - drawing of an outlay of the transmission force over the winches with abeam areas, - drawing of an outlay (testing) of welding of the cylinder bearing for locking/unlocking on the lower housing (load testing in open and closed postures), - drawing of an outlay (testing) of welding of the cylinder bearing for locking/unlocking on the upper housing (load testing in open and closed postures), - testing of the screw strength on the cylinder bearing for opening/closing on the upper housing, - testing of the load on the shafts, which form the connection of opening/closing cylinder and ears on the lower housing, - testing of the opening/closing mantle, - drawing up of an outlay of welding on the opening/closing cylinder, - testing of the thread connecting rod and cylinder lid for opening/closing, - Drawing up of an outlay of welding on the cylinder shafts (ears) for gripping for pressures of p=40 bar and p=60 bar.

Comments

Title	Simplified project: " Outlay of the basic elements of a band transporter – Soda Factory Lukavac ",
Authors	10. Avdić H. , Demirović A.:
Publisher, place and year	Building Equipment Factory, d.o.o. Banovići, Banovići, 2007, (Project task number: 1099/07, July 2007)
Short summary	In the framework of the simplified project, the following was done: <ul style="list-style-type: none"> • Capacity audit of the conveying system and the band width • the effective power necessary for the conveyance drive was calculated • An engine for the conveyance drive was chosen • Towing force on the band was calculated • Number of fillers was calculated and the rubber band was chosen • A selection of the drive, backward and yoke cylinder • A selection of the splitter-box.

Comments

Acknowledgements and awards

Title	Diploma for working virtues
Institution	Complex Organisation of Associated Work Tito's Coal Mines in Tuzla Working Organisation Coal Mines Tito Banovići, Open Exploitation of Coal, Banovići, 21 December 1987
Background (reason)	On the occasion of Miners' Day
Short description	Traditional acknowledgement on the occasion of Miners' Day for the best results in work in the past year
Comments	

Membership in professional societies

Society / Associations	GOMA – Croatian Society of Fuels and Lubricants
Short description of the society / Association	The Croatian Society of Fuels and Lubricants operates as a non-governmental and non-profitable society for more than forty years. One of the most important activities of the society is the organisation of scientific and professional symposiums about fuels and lubricants, which are mainly of international character. The publication of the magazine <i>Fuels and Lubricants</i> presents the second important continuous activity of the Croatian Society of Fuels and Lubricants
Address of the Society / web reference	Berislavićeva 6, 10000 Zagreb, Croatia, tel. +385 1 4873 549, http://www.goma.hr
Position in the association	Member
Comments	Long-standing member due to the tasks and activities of the society (according to the statute) which contributes to the my continuous development: <ul style="list-style-type: none">- encouragement and development of scientific and professional thought and points of view about the recent technical, economical and educational methods, in view of the rational application of liquid and gaseous fuels and the accurate application of lubricants. In this way, we stay connected and cooperate with societies, institutions and specialized vocational organizations and faculties,- gathering and organising of experts and scientific workers dealing with tribology and the application problems of lubricants, as well as their professional development and encouragement to creative initiatives for the promotion of scientific and technical disciplines,- professional development of the members of the society,- Active participation in the protection of the environment.

Society / Associations	HDO – Croatian Society of Maintainers is a non-profitable society, founded in 1977 Functioning as a non-profitable society, Croatian Society of Maintainers is aimed at promotion of knowledge about the maintenance of property and the exchange of information between maintainers in the country and in the world in order to enhance the efficacy and economy of maintenance. Using the knowledge and the experience of its members, as well as other available knowledge about
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maintenance as sources, but benchmarking as a working method, the aim is to reach efficacy and economy of maintenance on the level of some developed European countries.

Address of the Society / web reference

Berislavićeva 6, Zagreb, Croatia, <http://www.hdo.hr>

Position in the association

Member

Comments

Long-standing member of the society and participator of many symposiums organised by this society, which contribute to my continuous development.

Society / Associations

DOTS – Society of Maintainers of Technical Systems, Republic of Serbia

Society of Maintainers of Technical Systems (DOTS) was founded in order to improve the maintenance function of technical system in all economy branches. In addition to this basic aim, Society of Maintainers of Technical Systems, focuses special attention to:

- Organisation of courses, seminars and symposiums;
- Research-development services in economic trades;
- Engineering;
- Organisation of fairs and exhibitions;
- Publishing;
- Overseas cooperation.

The internet presentation of the Society of Maintainers of Technical Systems (DOTS) is focused on the regular informing of all members and interested about the newest events in the field of maintenance of technical systems.

Address of the Society / web reference

Vatroslava Lisinskog 12a, 11108 Beograd , +381 11 2088 041, <http://dots.org.rs>

Position in the association

Member

Comments

Long-standing member of the society. I receive magazines published by the society regularly. The magazines contain a lot of information necessary for my professional and scientific education and the promotion about the maintenance function in the company.

Participation in the educational process

Rank of Assistant / Senior Assistant

Worked as an **assistant** from 1996 to 1997, and performed exercises in the subject “Transport systems” in the Faculty of Electrical and Mechanical Engineering in Tuzla,

From 26 November 1997 to 18 July 2002, worked as and **senior assistant**, and performed exercises in the subject “Transport systems and devices” in the Faculty of Electrical and Mechanical Engineering in Tuzla,

Rank of docent

Worked as Docent from 18 July 2002 to 19 March 2008, and lectured the subjects “Diagnostics and expert systems”, “Technical Diagnostics” and

Rank of Associate Professor

“Terotechnology” – Faculty of Mechanical Engineering in Tuzla
Since 19 March 2008 have worked as an Associate Professor and have lectured the subjects “Diagnostics and expert systems”, “Technical Diagnostics” and “Terotechnology” – Faculty of Mechanical Engineering in Tuzla

Rank of Full Professor

Other

Mentoring master theses and doctoral theses

Master theses

Buljubašić Sanel: "Interaction of technical diagnostics on water-supply system designed by the fractals method", Faculty of Mechanical Engineering, Tuzla, 2007, (Decision on granting the accepted master thesis and appointing the mentor, number: 02/6-7548-7/06 from 10 November 2006 – Decision on appointing a commission for evaluation of the master thesis, number: 02/6-6006-4.2/07 from 10 September 2007- Decision on accepting the Commission’s report about the mark of the master thesis, number: 02/06 – 6976 – 4 – 1/07 from 08 October 2007– Decision on appointing a commission for the master thesis presentation number:02/6-6976-4-2/07 from 08 October 2007)

Osmanović Almir: "Scientific approach to innovating the hydraulic system of mobile machines ", Faculty of Mechanical Engineering, Tuzla, 2009., (Decision on appointing a commission for evaluation of the master thesis, number: 02/6-9230-5/08 from 25 December 2008 – Decision on accepting the Commission’s report about the mark of the master thesis, number: 02/6-4-2/09 from 06 January 2009, Decision on appointing a commission for the master thesis presentation, number: 02/6-4-3/09 from 06 January 2009)

Indicate the candidate’s names, title of the thesis, institution and year

Doctoral theses

Karić Alija: "A research model of the sliding wearing for partial contacts ", University of Tuzla, Tuzla, 2005, (Decision on forming a commission for the condition evaluation of the candidate for acquiring the scientific degree of Doctor of Science and the suitability of the theme for the doctoral theses, number: 03-5-7.3.4/05 from 12 January 2005, Decision on accepting the Commission’s report, number: 03-3700-12.7/05 from 22 June 2005, Decision on appointing a commission for the evaluation of the doctoral theses, number: 03-3565-14.2.6/08 from 14 May 2008– Decision on accepting the Commission’s report and on appointing a commission for the doctoral thesis presentation, number: 03-4986-10.1.2/08 from 25 June 2008)

Research projects and studies

Finished projects

"TECHNO-ECONOMICAL JUSTIFICATION FOR THE PURCHASE OF THE DEVICE FOR LASER ALIGNMENT OF MACHINES ", Decision number: 7252/08 from 07 July 2008, Coal Mines Banovići, joint-stock company Banovići, Banovići 2008, Total sum of the project plus the purchase of the device for laser alignment is 30 000 KM, (In the framework of the project, the following was done: theoretical researches, analysis of the existing alignment modus of equipment in the Coal Mines Banovići, proposal for the introduction of a new alignment modus of equipment, defining the equipment – device for alignment, analysis of the techno-economical justification for the purchase of the device for laser alignment.)

It is well-known that the shaft misalignments of rotational equipment (such as pumps, compressors, ventilators) expose mechanical elements to additional burden, causing an enhanced wearing and early failures. The mentioned burden reduces exponentially the expectancy of bearing and cause the enhanced wearing of couplings. Moreover, they reduce the efficiency and the expectancy of seals (bad alignment causes misalignment of seals on shafts, which cause preconditions for the lubricant leakage and contamination of the bare bearing). Bad alignment of rotational equipment generates vibrations which additionally strain mechanical elements, and in this way reduce the machine efficacy (within the meaning of the production capacity and quality).

Machine alignment is connected with the expenses of electrical consumption. After the right alignment, the savings of electrical energy are more than 20 percent.

A research has shown that a bad alignment of shafts causes more that 50 percent conditions "IN FAILURE" of rotational machines and equipment. Therefore, the organized care for the accurate alignment presents the most profitable form of preventive maintenance.

"AN OUTLAY OF THE ELEMENTS LIFTING TOOL PNr: 6014", AS Connector Bosnia d.o.o. Tuzla, Tuzla, 2008. Price of the designing: 5000 KM. In the framework of the simplified project, the following was done: an outlay of the reaction force of the support by maximum load, check of the alongside profile of the main frame for bending in a critical intersection, an outlay of the maximum load of support, check of the boxed profile of the support for bending in a critical intersection B-B, an outlay of moments and welding connected to the support and main frame, check of the welding connection of consoles and cylinder foot support, check of screw stress of cylinder support and console connection, check of stress and welding of assembly elements 6014K-4 and 6014K-5, check of the telescope cylinder elements, check of the screw stress of the joint connection of the telescope cylinder and head, check of the cylinder elements 6014-11.

"TECHNICAL DOCUMENTATION OF THE MACHINE FOR THE PRODUCTION OF CONCRETE", Building Equipment Factory Banovići, d.o.o. Banovići, Banovići, 2008. Price of the designing: 5000 KM. In the framework of the technical project, the following was done: an elaboration of the technical documentation in accordance with regulations and standards for this area.

Current projects

"JUSTIFICATION OF INTRODUCING TECHNICAL DIAGNOSTICS INTO THE COAL MINES BANOVIĆI ", Decision number: , Coal Mines Banovići, joint-stock company Banovići, Banovići 2009. Total sum of the project is 100 000 Km plus the purchase of the device for technical diagnostics. (It is necessary to do the following: theoretical researches, analysis of the existing diagnostics modus of equipment, analysis of the maintenance expenses (direct and indirect), introduction programme of technical diagnostics, and proposal for a change of the maintenance organization for technical diagnostics.)

On the one hand, technical diagnostics presents technology connected to the technical system condition or the designing object, and on the other hand to the maintenance system applied to this object in order to secure its accurate functioning (securing the necessary level of exploitation reliability). The allocation diagnostics in a maintenance system of one technical system supervenes out of its dual part. It defines whether the technical system is in its "WORKING" condition or its "IN FAILURE" condition. It acts controlling and preventive. On the other hand, if it, during the control of a technical system, is determined that the system does not perform its function, and then the expectation of diagnostics is to draw attention to the breakdown reasons and to forecast the technical system condition in the future.

Planned projects (expecting, in preparation)

"REENGINEERING OF THE MAINTENANCE PROCESS IN THE COAL MINES BANOVIĆI, JOINT-STOCK COMPANY BANOVIĆI", Coal Mines Banovići, joint-stock company Banovići, Banovići, 2009

Personal skills and competences

Mother tongue

Bosnian

Other languages

Comprehension		speaking		writing
listening	reading	Speech interaction	speech	

Language

Language

English	English	English		
Russian	Russian	Russian		

Scientific, vocational and social competences

Competences in guiding scientific researches and teaching in high education

I think that I possess competences to guide scientific researches. Regarding the teaching process, I have been teaching and lecturing since 1996.

Competences in participation in scientific-research projects

According to my work and the things stated in the CV, I think that I possess the competences and quality to participate in a scientific- research project.

Scientific-research interests and present development

I possess a very developed scientific-research interest in the field of theoretical-experimental researches, emphasis put on experimental researches with mathematical modelling.

Planned specialization

I plan to work continuously on my development in the field of Terotechnology and Technical Diagnostics, especially on the implementation of acquired theoretical knowledge into the praxis.

Social skills and competences

I fit into social movements. The ability to work with people has been developed over the long period of managing affairs in the Coal Mines Banovići.

Organizational skills and competences

I master the skills of organising the maintenance process. I have been working in managing processes of equipment maintenance in the Coal Mines Banovići for over twenty-five years.

Technical skills and competences

I master the design and audit proceedings. I have been specially mastering the management of terotechnological processes.

Computer skills and competences

I have been using computers for a long time. I know how to use software necessary for my work in the company and in the faculty.

Artistic skills and competences

Other skills and competences

Other information

Published books

Avdić H., Tufekčić Dž.: «**TEROTECHNOLOGY I**», University of Tuzla, PrintCom d.o.o. graphical engineering, Tuzla, 2007.

ISBN 978-9958-663-73-7

COBISS.BH-ID 1582020294

Consulting Editors: Dr. sc. Pašaga Muratović, full professor and Dr. sc. Šelo Ramiz, associate professor, Faculty of Mechanical Engineering University of Tuzla

Decision of the Senate of the University of Tuzla in Tuzla, number: 03-1380-8.2/07 from 21 March 2007, This book is approved as a course book.

Short critical review

The book "TEROTECHNOLOGY I" was printed in the format B5 (font 12 – Times New Roman), using normal spacing. The book contains 196 pages, 5 chapter, counting also the chapters "Literature" and "Index of Symbols".

In the first chapter *A systematic approach to technical maintenance*, the following was elaborated: basic terms about technical systems, the maintenance aims, maintenance as a function, integral systematic approach to maintenance, maintenance expenses in the system cycle, failure modes of technical systems, maintenance methodology, the future of maintenance and the maintenance process.

In the second chapter *The functional security of technical systems* deals with: basic characteristics of the maintenance system, reliability, availability and functional suitability, functional parameters of distribution, basic characteristics of the functional availability, system availability made up of many parts, failure analysis, efficiency and availability, functional suitability, maintenance suitability, a model of the maintenance process and auxiliary characteristics of the maintenance system.

In the third chapter *Models of the maintenance system*, the following was elaborated: managing the condition of technical systems, variants of maintenance strategies, optimization of the working system, maintenance models, characteristics of subsequent maintenance, characteristics of preventive maintenance, maintenance characteristics and models according to the condition, maintenance models according to the condition with the control of reliability, formation of the maintenance programme and algorithm for the election of a maintenance model according to the condition.

"TEROTECHNOLOGY" presents a qualitative elaborated material in the field of terotechnology and maintenance diagnostics. This approach enables an easier mastering of the material, especially the efficiency of technical systems, technology and maintenance organization. This book is intended to give help to students of the Faculty of Mechanical Engineering in Tuzla, and students of the food, building, and wood and textile industry. This book offers an easier approach to subjects like Terotechnology, Diagnostics and expert systems, and Technical diagnostics, which are taught in the Faculty of Mechanical Engineering.

The concept of lecturing this subject is the result of the long-term working experience of the author in production, lecturing this subject and the work in the subject field. An up-to-date approach to elaboration enables the reader to use this book individually or in addition to other books dealing with these issues. The author used basic pedagogical principles and the whole text is completely adapted to the mentioned subjects. This book hugely contributes to the education of students of mechanical engineering or technical studies. It has also a special value due to the lack of literature in the field of terotechnology and diagnostics in production systems.

Book reviews

Avdić F.: "THE BASIS OF TECHNICAL DRAWINGS FOR METAL OCCUPATIONS ", Government of Brčko District BiH, Education Department, Brčko, 2006,

Avdić F.: "DESIGNING – Workbook with exercises in technical drawing ", Government of Brčko District BiH, Education Department,

Brčko 2006.

Innovations – technical advancements

- Hašarić Z.,
Avdić H.:
Avdić H.,
Čolić R.:
Avdić H.,
Rahmanović
E.:
Avdić H.,
Čolić R.:
Avdić H.,
Avdić A.:
- "Problem solving of hydro motor drilling on drills Gryphon 5C"**, Coal Mines Banovići, Banovići, 1986,
"Reconstruction of truck radiator type LH-M 120 for a diesel hydraulic locomotive series 740", Coal Mines Banovići, Banovići, 2002,
"Substitution of a diesel engine type S46/I on the drills GRYPHON 5C, internal code 4 and 7 ", Coal Mines Banovići, Banovići, 2002,
"Reparation of the sleeve of the CUMMINS engine crankcase and substitution of the oil-sump", Coal Mines Banovići, Banovići, 2003,
"Substitution of a brake on the hoist mechanism of the excavator MARION 201 M", Coal Mines Banovići, Banovići, 2003,

Revisions

- Avdić H.:
Avdić H.:
Avdić H.:
Avdić H.:
Avdić H.:
Avdić H.:
Avdić H.:
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Avdić H.:
Avdić H.:
Avdić H.:
- "Technical Project I – system segment for the waste-rock in the Open Pit- Grivice"**, Coal Mines Banovići, Banovići, 1990,
"Backbone transport I – phase, technological – mechanical part", Coal Mines Banovići, Banovići, 1991,
"Project unit check for testing and certification of application products", Banovići, 1992,
"Project gasoline station in Banovići", Banovići, 1993,
"Methodology of annual plan drafting ", Coal Mines Banovići, Banovići, 2000,
"Annual working plan of the Coal Mines Banovići for 2001", Coal Mines Banovići, Banovići, 2001,
"Annual working plan of the Coal Mines Banovići for 2002", Coal Mines Banovići, Banovići, 2002,
"Technical-technological programme of enhancing production and mechanization of the technological working process in the Underground Exploitation Mine ", Banovići, 2002,
"Annual working plan of the Coal Mines Banovići for 2003", Coal Mines Banovići, Banovići, 2003,
(Decision number: 1057/02 from 14 October 2002)
"Enhancing production and mechanization of the technological working process in the Underground Exploitation Mine " Coal Mines Banovići in Banovići, Banovići, 2002,
(Decision number: 1382/02 from 25 February 2002)
"Annual working plan of the Coal Mines Banovići for 2004", Coal Mines Banovići, Banovići, 2004,
(Decision number: 8468/03 from 19 November 2003)

Professional projects	Avdić H.:	Technical documentation: “Device for assembling and disassembling bumpers for trucks LH-M-120” , Coal Mines Banovići, Banovići, 1979,
	Avdić H.:	“Built-up welding technology of pivots and excavator shafts” , Coal Mines Banovići, Banovići, 1979,
	Avdić H.:	Documentation: “Tool for extracting shafts of the back bumper of the truck LH-M-120” , Coal Mines Banovići, Banovići, 1979,
	Avdić H.:	“Reconstruction of the transport ramp Open Pit Ravne, with an embedded cracker on the existing ramp” , Coal Mines Banovići, Banovići, 1980,
	Avdić H.:	“Reparational welding of the housing of the central excavator M-7200 shaft” , Coal Mines Banovići, Banovići, 1982,
	Avdić H.:	“Reconstruction of the housing of the central excavator EŠ-5/45 shaft” , Coal Mines Banovići, Banovići, 1984,
	Avdić H.:	“Reparational welding of linears for excavators PH-1900 and PH-1900AL” , Coal Mines Banovići, Banovići, 1985,
	Avdić H.:	Technical documentation: “Gearbox of the circular movement of excavator PH-1900” , Technical documentation, Banovići, 1988,
	Avdić H.:	Technology: “Regeneration of the drive wheel of excavator PH-1900 and 1900AL” , Technical documentation, Banovići, 1989,
	Avdić H.:	Project: “Maintenance organization of the section Surface exploitation” , Coal Mines Banovići, Banovići, 1989,
	Avdić H., Ikić M.:	“Elaboration on a recovery programme for production in the Coal Mines Banovići” , Coal Mines Banovići, Banovići, 1995,
	Avdić H., Cilović L.:	“Restructuring programme of the Coal Mine Tuzla in Tuzla” , Banovići, 1995,
	Avdić H., Lapandić I., Čolić A.:	“Technical-technological possibilities of embedding a rubber conveying band EP-2000/4 K 6/4 1000/20 on the band conveyer GTK 100/673” , Pit exploitation of coal, Coal Mines Banovići, Banovići, 2000.

Mentoring diploma papers

1. Džibrić E.: Application of the technical diagnostic method on defining the condition of the conveying system for coal Čubrić – Draganja in the Coal Mines Banovići – Banovići, Faculty of Mechanical Engineering, Tuzla, 2005,
2. Hadžić E.: Condition diagnosis of dumper trucks, transport capacity 1700 [KN] by applying control methods on working parameters, Faculty of Mechanical Engineering, Tuzla, 2005,
3. Mulić A.: Condition diagnostics of high-productive technical systems in mining, Faculty of Mechanical Engineering, Tuzla, 2006,
4. Poljić M.: Impact of vibrations on the accuracy condition of the hoist mechanism of the shovel excavator PH – 1900 in the Coal Mines Banovići – Banovići, Faculty of Mechanical Engineering, Tuzla, 2006,
5. Suljkanović A.: Condition performance analysis of motor oil on the duration period of the motor module of bulldozer KOMATSU D155AX – 5 in the Coal Mines Banovići – Banovići, Faculty of Mechanical Engineering, Tuzla, 2006,
6. Husić N.: Condition diagnostics of facilities in the section Separation in the Coal Mines Banovići – Banovići, Faculty of Mechanical Engineering, Tuzla, 2007,
7. Hasanović M.: Condition diagnostics of hydrostatic power transmitting for rotational drilling on the drill GRYPHON 5C in the Coal Mines Banovići, Faculty of Mechanical Engineering, Tuzla, 2007,
8. Kukić S.: The impact of technical diagnostics on the availability of the shovel excavator PH – 1900 AL in the Coal Mines Banovići, Faculty of Mechanical Engineering, Tuzla, 2007,
9. Bečić A.: Condition diagnostics of vibration sieves by applying constant (monitoring) diagnostics, Faculty of Mechanical Engineering, Tuzla, 2007,
10. Poljaković F.: Applying the shock pulse method by defining the condition of rolling bearings, Faculty of Mechanical Engineering, Tuzla, 2007,
11. Demirović M.: Condition diagnostics of hydrostatic power transmitting for transport on the hydraulic excavator RH 120 E in the Coal Mines Banovići, Faculty of Mechanical Engineering, Tuzla, 2007.

Annexed documents

List all documents which according to the procedures are attached to the CV

Comment: Upon being chosen as an associate professor, I handed all the necessary documents to the University.