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Engineering

00001

PI: 20203921 JA: 0203

TI: Flow accelerated corrosion: influence of pH

AU: Lobos Cebrero L A

JN: Celul. Pap. (Chile) \$IS=0716-2308

CI: vol. 16, no. 2, May 2000, pp 3-4, 6-8 (C, K, P, S)

CT: AMINE/ CONDENSATE/ CORROSION/ EVAPORATION/ IRON/ PH/ PIPING/

AB: The concentration of dissolved iron in the clean condenser of the evaporation plant has to be maintained under 15ppbn in order to reduce its penetration into the boiler. A case study of the Arauco plant includes an evaluation of the technical antecedents.

Based on the latter, a system of Flow Accelerated Corrosion (FAC) was proposed to explain certain localised problems, such as thinning of the tank walls and other equipment. After the application of amine into the system, the concentration of iron was reduced from 58ppbn to 27ppbn and the electrical conductivity of the condenser increased by 103%. (1 fig, 6 tab)

SO: B

00002

PI: 20204009 JA: 0203

TI: Metso starts the remote service of paper mills

AU: Seppanen J

JN: Tek. Talous \$IS=0785-997X

CI: no. 38, 1 Nov. 2001, p. 4 (K)

CT: DIAGNOSTICS/ PAPER MILL/ PROCESS CONTROL/ PULP MILL/ TECHNICAL SERVICE/

CN: Metso Automation

AB: The first "Future Care" centre was inaugurated by Metso Automation at Tampere,

Finland. It works as a kind of a remote control room of paper mill production processes where Metso's experts have the opportunity to survey the operation. Real time communication system is established between the client and the expert, and should problems occur, the client can contact his closest local Metso expert or agent for rectifying the situation. So far, four Finnish mills are connected to the centre, and foreign mills are sought and offered the same opportunity. The aim is to prevent unnecessary production standstills and foresee any problems ahead. The unit is also called Pulp Centre and it aims to offer services beyond those involved in the traditional maintenance contracts. The Centre is strictly supervised with only 10 persons allowed access due to the confidentiality aspects of the work.

SO: B

00003

PI: 20204079 JA: 0203

TI: The inner and outer surface cracking of the recovery boiler floor tubes (Extended Abstract)

AU: Saarinen P

JN: Solutions!

CI: Dec. 2001, p. 40 (C, K, P, S)

CT: CRACKING/ RECOVERY PLANT/ TUBE/

AB: The cracking of AISI 304L composite floor tubes in a recovery boiler was studied. The cracks were classified by size, shape and location following examination with a stereo microscope, and the residual stresses on the tube surfaces measured in the vicinity of the cracks and at undamaged portions of the tubes. The crack initiation mechanism was examined by the study of crack nuclei. The hardness of sections of claddings was measured and samples were measured by electrochemical potentiokinetic reactivation (EPR). Smaller cracks (Class 1) were mostly located near the tube crown and grew transversely to the axial direction. Class 2 and Class 3 cracks were longer than Class 1, Class 2 cracks being at a higher density and less open on the surface. Class 4 and Class 5 cracks were branching, Class 4 cracks being located near the tube crown and were less regular than Class 5 cracks. Where transverse cracks appear it is possible that there is cracking on the inner surface of the tube. The related cellular dislocation structure in the cladding is indicative of fatigue loading. Branching cracks propagate easily through the cladding, but are sometimes stopped at the interface between the cladding and carbon steel. (21 fig, 5 tab, 10 ref) (Full text available from Tappi only)

SO: B

00004

PI: 20204604 JA: 0203

TI: Hydroblasting technical efficiency and big risk joined for maximum safety

AU: Ventura Rodrigues J M

JN: Papel \$IS=

CI: vol. 62, no. 8, Aug. 2001, pp 89-97 (C, K, S)

CT: CLEANING/ EFFICIENCY/ HIGH PRESSURE/ MAINTENANCE/ SAFETY/ WATER JET/

AB: Hydroblasting, the application of water in low to very high pressures with or without sand, is a useful method to conserve industrial equipment. In pulp and paper machines

it can remove the deposits that hinder paper quality and damage equipment such as lime kilns, recovery boilers and other metallic structures. A series of tests were carried out at Aracruz to determine the maximum pressure of hydroblasting to be applied on its pulp equipment and to establish the safety measures needed to protect the persons involved in the process. Aracruz decided to outsource the service of hydroblasting and used the information obtained to specify all the details of the contract service. (8 fig, 3 tab, 5 ref)

SO: B

00005

PI: 20204626 JA: 0203

TI: Preventive maintenance improves productivity and quality

AU: Anon

JN: Celul. Pap. (Chile) \$IS=0716-2308

CI: vol. 15, no. 1, Mar. 1999, pp 18-28 (C, K, P, S)

CT: MANAGEMENT/ PREVENTIVE MAINTENANCE/ PRODUCTIVITY/ QUALITY/ SAFETY/ VIBRATION/ VIBRATION ANALYSIS/

AB: Preventive maintenance has become much more simple with the development of computerised software systems that accompany the equipment's performance. One aspect of preventive maintenance that is frequently overlooked is the human factor, which lurks behind the decision to invest or not in the correct equipment. Attitude towards preventive maintenance is another human factor often neglected. Vibrations can be analysed through resonance while the spectral analysis of currents can be utilised in the diagnosis of a series of processes or equipment checks from the performance of a generator to a malfunctioning caused by lack of lubrication.

SO: B

00006

PI: 20205053 JA: 0203

TI: Comparison testing of IEE standard 841 motors

AU: Wallace A K; Rooks J A; Holmquist J R

CI: 2001 IEEE annual pulp and paper industry technical conference, Portland, OR, USA, 18-22 June 2001, pp 9-16 < Piscataway, NJ, USA: IEEE Industry Applications Society, 2001, 246pp, USD150.00 (ISBN 0780367456)> (K, P, S)

CT: BEARING/ CONFERENCE/ EFFICIENCY/ MOTOR/ STANDARD/ TEMPERATURE/ TEST METHOD/

CN: IEEE Industry Applications Society

AB: The IEEE Standard 841 was developed to provide a set of detailed requirements for severe duty, totally enclosed fan cooled, squirrel cage induction motors, rated up to 500hp for the petroleum and chemical industries. The IEEE/IAS Pulp and Paper Industry Committee has been studying this standard for possible adoption by the pulp and paper industry. A comparison testing programme was carried out by the Motor Systems Resource Facility (MSRF) in support of an industry investigation of the available motors manufactured to the IEEE Standard 841. Seven major manufacturers took part, each providing a 50hp, a 100hp and a 200hp "standard" IEEE 841 motor for examination on delivery and IEEE112 Method A efficiency testing. All motors were easily compliant to the winding temperature rise recommendation of 80 deg C. Power factors were good over a wide load range and the majority of motors achieved the specified full-load

efficiencies. However, bearing temperature rise in excess of 45 deg C was more frequently exceeded than met and the problem appeared to be exacerbated with increasing motor size. (5 fig, 12 tab, 3 ref)

SO: B

00007

PI: 20205057 JA: 0203

TI: Failure contributors of MV electrical equipment and condition assessment program development

AU: Paoletti G; Baier M

CI: 2001 IEEE annual pulp and paper industry technical conference, Portland, OR, USA, 18-22 June 2001, pp37-47 <Piscataway, NJ, USA: IEEE Industry Applications Society, 2001, 246pp, USD150.00 (ISBN 0780367456)> (K, P, S)

CT: CONFERENCE/ ELECTRIC EQUIPMENT/ FAULT DIAGNOSTICS/ MAINTENANCE/ SWITCHGEAR/

CN: IEEE Industry Applications Society

AB: A comprehensive condition assessment programme has been developed for medium voltage (MV) switchgear using the statistical data pertaining to the equipment failure contributing causes. The programme development began with an analysis of the equipment failure contributing causes and survey data documented by IEEE. IEEE Standard 493-1997 comprises detailed data related to the reliability of various components of the electrical systems. The data were analysed and online monitoring diagnostic technologies reviewed and selected to address the failure initiating causes in the order of their importance. The two online diagnostic technologies identified were: partial discharge diagnostics (PDD) and infrared thermography. PDD is expected to form the basis for implementation of the economically viable condition-based monitoring programmes for the medium voltage switchgear. Safety related issues were shown as having probable effect on approximately 50% of the contributing failure causes for MV switchgear and should therefore always be given the highest priority. (4 fig, 7 tab, 4 ref)

SO: B

00008

PI: 20205058 JA: 0203

TI: Selection of best induction motor rotor construction method

AU: Finley W R; Hodowanec M M

CI: 2001 IEEE annual pulp and paper industry technical conference, Portland, OR, USA, 18-22 June 2001, pp 48-58 <Piscataway, NJ, USA: IEEE Industry Applications Society, 2001, 246pp, USD150.00 (ISBN 0780367456)> (K, P, S)

CT: ALUMINIUM/ CONFERENCE/ COPPER/ MOTOR/ ROTOR/

CN: IEEE Industry Applications Society

AB: There are four types of rotor construction for squirrel cage induction motors: aluminium die cast; copper die cast; fabricated aluminium bars and fabricated copper bar. Copper die cast are not in common use. Aluminium and copper die cast rotors can be made with diameters of up to 30in and core lengths of 50in. However, for reasons of tooling costs and demand ratings in excess of 1,750HP are unusual. Copper die cast are more difficult to manufacture due to the increased temperatures and pressures required. Copper bar rotors can be made in any size but the process is economically unattractive for small motors. Fabricated aluminium bar rotors are cheaper than fabri-

cated copper bar rotors and do not have the size limitations of die cast rotors. Rotational stresses occur in lamination stresses, end connector stresses and tensile hoop stresses of the end connector retaining ring. Residual stresses arise as a consequence of the manufacturing process. Factors to be taken into account when selecting a rotor construction method include locked rotor torque, electrical performance, rotor bar heat capacity, efficiency and rotor design flexibility. On starting, rotor bars must withstand bending, vibration and inertia loads. Fabricated copper construction allows for easier maintenance. (13 fig, 4 tab, 10 ref)

SO: B

00009

PI: 20205062 JA: 0203

TI: Commissioning numerical relays

AU: Closson J R; Young M

CI: 2001 IEEE annual pulp and paper industry technical conference, Portland, OR, USA, 18-22 June 2001, pp 81-91 <Piscataway, NJ, USA: IEEE Industry Applications Society, 2001, 246pp, USD150.00 (ISBN 0780367456)> (K, P, S)

CT: CONFERENCE/ ELECTRIC RELAY/ TESTING/

CN: IEEE Industry Applications Society

AB: Modern numerical relays have many new features including setting groups, programmable logic and adaptive schemes. These features create a need for reviewing commissioning methods. In commissioning any kind of protective relay, calibration and functional tests and in service readings should be carried out. Adjustments to testing techniques need to be made to accommodate the enhanced capabilities of numerical relays. Automatic or adaptive features on test plans need to be identified, to make them part of the testing and commissioning process. "Test" setting groups should be created to eliminate the need for disabling elements during testing. Configuration and testing inputs/outputs should be included as part of the commissioning process and logic diagrams should be made an integral part of the schematic diagrams. Documentation procedures should be developed to avoid confusion and keep information at hand in the field. Advantage should be taken of the features of numerical relays that make both commissioning and troubleshooting easier. (9 fig, 5 ref)

SO: B

00010

PI: 20205063 JA: 0203

TI: Failure modes and field testing of medium voltage motor windings

AU: Gleichman R

CI: 2001 IEEE annual pulp and paper industry technical conference, Portland, OR, USA, 18-22 June 2001, pp 92-95 <Piscataway, NJ, USA: IEEE Industry Applications Society, 2001, 246pp, USD150.00 (ISBN 0780367456)> (K, P, S)

CT: CONFERENCE/ ELECTRIC MOTOR/ PREDICTIVE MAINTENANCE/ TEST METHOD/

CN: IEEE Industry Applications Society

AB: The four most typical contributing causes of stator winding failure in electric motors are: surface contamination, over temperature operation, moisture and over voltage and voltage spikes. Predictive tests are used to evaluate winding integrity before a motor failure is caused and include partial discharge analysis, insulation resistance testing

(Megger) and winding capacitance testing. Diagnostic tests are used to define and isolate known problems and are frequently performed offline. They include surge tests, winding resistance testing and inductive balance testing. The best way to measure motor winding residual life is through partial discharge monitoring and analysis. As the organic insulation enters failure mode, partial discharge activity changes and analysis of the changing characteristics can determine the winding residual life. Surge, inductive imbalance and winding resistance tests are best employed as diagnostic tests on a failed winding. (2 fig)

SO: B

00011

PI: 20205064 JA: 0203

TI: Motor bearing systems for forest products applications

AU: Bonnett A H; Albers T

CI: 2001 IEEE annual pulp and paper industry technical conference, Portland, OR, USA, 18-22 June 2001, pp 96-109 <Piscataway, NJ, USA: IEEE Industry Applications Society, 2001, 246pp, USD150.00 (ISBN 0780367456)> (K, P, S)

CT: BEARING/ CONFERENCE/ ELECTRIC MOTOR/ MAINTENANCE/

CN: IEEE Industry Applications Society

AB: Bearing enclosures can be open, shielded or sealed, the choice depending on the need to replenish lubricants and to protect the lubricants from contamination. Bearings are manufactured to rigid tolerance specifications. Bearings must be lubricated to ease sliding contacts, to protect the surface finish of components, to seal the bearing from contaminants and to assist in heat dissipation. During motor relubrication, care must be taken to avoid over greasing and the use of a grease incompatible with the original. With the use of standard lubricants, an operating temperature of 80-90 deg C is safe. Higher temperatures are tolerated by synthetic lubricants. To a first approximation, the life of a bearing is inversely proportional to the load raised to the third power and inversely proportional to the speed. When storing motors for 12-24 months, the shaft should be rotated periodically. During storage periods in excess of 24 months, the bearing cavities should be filled with grease. Induced shaft voltages may cause currents capable of damaging the bearings. The problem may be addressed by insulating the outboard or top bearing, the use of antifriction bearings with an insulated race or the use of shaft grounding. (22 fig, 8 tab, 16 ref)

SO: B

00012

PI: 20205069 JA: 0203

TI: Bearing fluting in AC motors, DC motors and rolls on paper machines

AU: Boyanton H E; Hodges G

CI: 2001 IEEE annual pulp and paper industry technical conference, Portland, OR, USA, 18-22 June 2001, pp 136-138 <Piscataway, NJ, USA: IEEE Industry Applications Society, 2001, 246pp, USD150.00 (ISBN 0780367456)> (K, P, S)

CT: BEARING/ CONFERENCE/ ELECTRIC MOTOR/ FAULT DIAGNOSTICS/ PAPER MILL/

CN: IEEE Industry Applications Society

AB: When unexpected bearing losses occurred at a paper mill, work was started on a long-term investigation to determine the causes and incidence of a type of bearing

damage called "bearing fluting". It was found that many paper machines had bearing fluting and also that bearing fluting was found to be associated with the use of alternating current (AC) or direct current (DC) sectional variable speed control. Extensive testing and observation led to the conclusion that the stationary and the rotating portions of the motor had to be mechanically connected together with a very low impedance path. This path would not permit the voltage to rise above the dielectric strength of the oil in the lubricant, thereby giving protection to all of the bearings in the entire bearing train from capacitance coupling. Shaft grounding has been used to successfully control electrical bearing damage, including fluting and frosting.

SO: B

00013

PI: 20205072 JA: 0203

TI: Silver corrosion and whiskers growth on power contacts in industrial atmosphere of pulp and paper plants

AU: Chudnovsky B H; Swindler D L; Thompson J R

CI: 2001 IEEE annual pulp and paper industry technical conference, Portland, OR, USA, 18-22 June 2001, pp 155-162 <Piscataway, NJ, USA: IEEE Industry Applications Society, 2001, 246pp, USD150.00 (ISBN 0780367456)> (K, P, S)

CT: CIRCUIT BREAKER/ CONFERENCE/ CORROSION/ FAILURE MODE ANALYSIS/ SILVER/ WHISKERING/

CN: IEEE Industry Applications Society

AB: The Duluth recycling pulp plant in Minnesota, USA, experienced a number of failures of circuit breakers caused by strong overheating and metallic whiskers were found growing from heavily corroded silver plated copper surfaces of the power contacts. Research was conducted to define the chemical composition of the whiskers, whiskers' morphology and the ranges of the whisker size, together with laboratory experiment focusing on the role of various environmental parameters and plating properties, in order to gain a better understanding of this phenomenon. Scanning Electron Microscopy (SEM) and Energy Dispersive X-Ray Spectrography (EDS) revealed most of the whiskers were made of 97-99% silver with 1-3% of copper and that the surface of the larger whiskers was covered with silver sulphide. As the silver whiskers are metallic formations, they are highly conductive. Several methods are recommended to slow down and control the growth of the highly hazardous formations, including: contact lubrication; temperature control; silver plating thickness; alternate plating; hydrogen sulphide chemical filtration; vapour corrosion inhibitors. (12 fig, 2 tab, 16 ref)

SO: B

00014

PI: 20205073 JA: 0203

TI: Modern on-line testing of induction motors for predictive maintenance and monitoring

AU: Wiedenbrug E

CI: 2001 IEEE annual pulp and paper industry technical conference, Portland, OR, USA, 18-22 June 2001, pp 163-168 <Piscataway, NJ, USA: IEEE Industry Applications Society, 2001, 246pp, USD150.00 (ISBN 0780367456)> (K, P, S)

CT: CONFERENCE/ ELECTRIC MOTOR/ ONLINE MEASUREMENT/ TESTING/

CN: IEEE Industry Applications Society

AB: Variable frequency drives (VFD) are increasingly used to replace direct current (DC) drives. Difficulties in monitoring such drives for predictive maintenance are being overcome with the use of modern online instrumentation. Steady state three phase voltages can vary in voltage level, voltage balance or voltage distortion all of which can affect the operation of an electric motor. The shaft torque can be monitored by measurement of stator currents and voltages. In a US power plant, increased cavitation and reduced water flow resulting from fracture to the endbell were correctly diagnosed by these methods in a submerged 1,500hp motor. Modern motor theory allows for accurate load monitoring directly from the electrical terminals of the motor and this load monitoring not only displays very accurate steady state speed measurements and operating torque calculations, but also reveals the instantaneous torque actually present on the shaft. (10 fig, 7 ref)
SO: B

00015

PI: 20205075 JA: 0203

TI: Heat tracing technology for the 21st century

AU: Barth R E

CI: 2001 IEEE annual pulp and paper industry technical conference, Portland, OR, USA, 18-22 June 2001, pp 174-179 <Piscataway, NJ, USA: IEEE Industry Applications Society, 2001, 246pp, USD150.00 (ISBN 0780367456)> (K, P, S)

CT: COMPUTATION/ CONFERENCE/ FLUID DYNAMICS/ MATHEMATICAL MODEL/

CN: IEEE Industry Applications Society

AB: The use of computational fluid dynamics (CFD) modelling in external electric heat tracing solutions is relatively recent and is proving to be an excellent resource in generating data used in modelling convection dominated heat transfer solutions over a wide range of product properties, while minimising the degree of experimental testing required. CFD analysis can often be carried out on a personal computer (PC) or engineering workstation. CFD has found particular application in heat tracing in the presence of conduction and fluid convection components. A CFD approach can give an accurate model of the application temperature profile of a water filled high density polyethylene (HDPE) plastic pipe. Observed nonuniformities in the heat transfer of a vertical pipe and the effects of imperfections in the insulation envelope can be explained with a CFD model. A CFD model can also be used to illustrate the advisability of siting heat tracing as low as possible on a storage vessel. CFD in the future will allow manufacturers to further improve the accuracy of information supplied in convection heat transfer domination applications. (14 fig, 6 ref)

SO: B

00016

PI: 20205076 JA: 0203

TI: Relative impulse strength of magnet wires at room temperature

AU: Wilson C A

CI: 2001 IEEE annual pulp and paper industry technical conference, Portland, OR, USA, 18-22 June 2001, pp 180-183 <Piscataway, NJ, USA: IEEE Industry Applications Society, 2001, 246pp, USD150.00 (ISBN 0780367456)> (K, P, S)

CT: ALTERNATING CURRENT/ CONFERENCE/ ELECTRIC MOTOR/ WIRE/

CN: IEEE Industry Applications Society

AB: A study was conducted in order to determine whether shielded magnet wire was superior to heavy and quad build wire for use in large (up to 900hp) random wound alternating current (AC) motors under all conditions. Five types of magnet wire were tested at three types of test voltages, at three voltage levels (short term, medium term and long term). It was found that, under the test conditions used, there was no significant difference between standard heavy build wire and the "shielded" wire from either of the manufacturers used. The dielectric strength of the quad wire was superior to the others, as was expected. No significant patterns were observed in the level of the breakdown data or failure locations and the difference in the short and medium term dielectric strength of the varnished and unvarnished coils was much less significant than expected. This was probably due to the short duration of these tests. (5 fig, 1 ref)
SO: B

00017

PI: 20205077 JA: 0203

TI: Carbon brush performance and application in the pulp and paper environment

AU: Roberge R

CI: 2001 IEEE annual pulp and paper industry technical conference, Portland, OR, USA, 18-22 June 2001, pp 184-191 <Piscataway, NJ, USA: IEEE Industry Applications Society, 2001, 246pp, USD150.00 (ISBN 0780367456)> (K, P, S)

CT: BRUSH/ CONFERENCE/ ELECTRIC MOTOR/ MAINTENANCE/ THEORY/

CN: IEEE Industry Applications Society

AB: An important maintenance function performed on direct current (DC) motors is the inspection of carbon brushes and commutators. Worn or failed brushes can make a paper machine inoperable. The two carbon brush families used extensively are electrographitic and graphite. Electrographitic grades provide high carbon brush to commutator contact drop; good communication; low friction, low abrasiveness; and current rating of approximately 80A/sq in. The benefits of the graphite grades include reduced threading, good filming, polishing action, wider resistivity range, current range of 10-65A/sq in and laminated structure. There are several theories used for carbon brush application in the paper industry and addresses the strength and weaknesses of each brush application theory. Evaluation of brush and commutator performance begins by documenting brush current density, commutator wear, amount of contaminants present and brush life. Once the baseline of these parameters is estimated, brush grade adjustments can be tested to optimise brush life and reduce commutator wear. (8 fig, 2 tab, 2 ref)

SO: B

00018

PI: 20205079 JA: 0203

TI: Motor repair specifications and repair-replace options for forest products and other industries

AU: Bonnett A; Yung C

CI: 2001 IEEE annual pulp and paper industry technical conference, Portland, OR, USA, 18-22 June 2001, pp 201-212 <Piscataway, NJ, USA: IEEE Industry Applications Society, 2001, 246pp, USD150.00 (ISBN 0780367456)> (K, P, S)

CT: CONFERENCE/ ELECTRIC MOTOR/ MAINTENANCE/

CN: IEEE Industry Applications Society

AB: This paper presents the basic sources of a motor service and repair guideline, built on the experience of the Electrical Apparatus Service Association (EASA) has produced guidelines for the maintenance and repair of squirrel-cage induction motors from 1-3,000hp and examines the repair or replacement of the stator, rotor, shaft, bearings, fans and mechanical parts. The selection of a repairer will depend on factors including cost, reliability and quality. Essential equipment for motor maintenance includes test panel, baseplate, vibration analysis equipment, balancing stand, electrical test equipment, growler, core tester, burnout oven, winding area and materials inventory. Other equipment includes capability for coil making, repair of Babbitt bearings, winding treatment and repair of explosion proof motors as well as a machine shop, adequate training and documentation, calibration testing additional services and the ability to provide references. A repair-replace decision model considers both types of repair and levels of repair. Once a fault has been determined, the service centre can work with the equipment owner to identify remedies. (12 fig, 4 tab, 11 ref)

SO: B

00019

PI: 20205081 JA: 0203

TI: Maintenance concerns for good operation of DC motors

AU: Lozowski G E

CI: 2001 IEEE annual pulp and paper industry technical conference, Portland, OR, USA, 18-22 June 2001, pp 223-232 <Piscataway, NJ, USA: IEEE Industry Applications Society, 2001, 246pp, USD150.00 (ISBN 0780367456)> (K, P, S)

CT: CONFERENCE/ ELECTRIC MOTOR/ MAINTENANCE/

CN: IEEE Industry Applications Society

AB: Major items of concern for successful long-term operation of direct current (DC) machines include: keeping the motor relatively clean both inside and out, providing good quantity/quality of ventilating air, providing good quality power, keeping vibration to a minimum, maintaining a good commutator condition, adjusting quantity or grade of brush to be suitable for the application, inspecting brushes regularly to obtain a wear history, not using silicone sealant to make the motor watertight, not overlubricating and ensuring the grease drain plug is removed during regreasing. Scheduled periodic visual inspections and recording information helps to diagnose motor problems or ascertain good operating health of DC motors. Designing room around the motor to make these inspections easier will ultimately mean more complete reports, easier brush changes and please the technicians. (6 fig, 4 tab)

SO: B

00020

PI: 20205082 JA: 0203

TI: Startup and commissioning procedures for electronically line-shafted paper machine drives

AU: Valenzuela M A; Lorenz R D

CI: 2001 IEEE annual pulp and paper industry technical conference, Portland, OR, USA, 18-22 June 2001, pp 233-240 <Piscataway, NJ, USA: IEEE Industry Applications Society, 2001, 246pp, USD150.00 (ISBN 0780367456)> (K, P, S)

CT: CONFERENCE/ DRIVE/ PAPER MACHINE/ STARTUP/

CN: IEEE Industry Applications Society

AB: To apply electronic line-shafting control to paper machine drives, it is necessary to develop a starting procedure for each individual section and a method for setting the parameters of the virtual line-shaft drive and in-shafts. Startup and commissioning procedures were evaluated both by simulation and experimentally in a four section laboratory test bed. The procedure for acceleration of the individual sections was implemented using virtual, variable-ratio gearboxes, emulating the physical clutches and conical pulleys used in the era of line shafts, while system stiffness was implemented using virtual in-shafts with active damping. The proposed virtual clutch/conical pulley assembly and active damping allows for smooth acceleration of each section and maintains well behaved response during load disturbances for all operating conditions. These features, together with its capability in handling severe load disturbances and/or sustained drive saturations, make the electronic line-shaft control an attractive control configuration for paper machine drives. (12 fig, 5 ref)

SO: B