Determining Remaining Strength Of Corroded Pipelines

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Non-destructive Testing and Repair of Pipelines Evgeny N. Barkanov 2017-07-27 This book describes efficient and safe repair operations for pipelines, and develops new methods for the detection and repair of volumetric surface defects in transmission pipelines. It also addresses the physics, mechanics, and applications of advanced materials used for composite repair of corroded pipelines. Presenting results obtained in the European Commission's INNOPIPES FRAMEWORK 7 programme, it develops long-range ultrasonic and phased array technologies for pipeline diagnostics, and explores their interactions with discontinuities and directional properties of ultrasonic antenna array. The book subsequently shares the results of non-destructive testing for different types of materials applications and advanced composite repair systems, and characterizes the mechanical properties by means of fracture methods and non-destructive techniques. In turn, the book assesses the currently available technologies for reinforcement of pipelines, drawing on the experience gai ned by project partners, and evaluates the recovery of the carrying capacity of pipeline sections with local corrosion damage by means of analytical and numerical procedures. It develops an optimization method based on the planning of experiments and surface techniques for advanced composite repair systems, before validating the numerical models developed and experimentally gauging the effectiveness of composite repair with the help of full-scale hydraulic tests.

Determination of Remaining Strength of Corroded Pipeline Using Closed - Form Solution Nur Fariza Talib 2013 Corrosion has become a main issue for all engineering sector in these decades. Failure due to corrosion has been one of the greatest concerns in maintaining the pipelines integrity. Therefore, corrosion defects must be accurately evaluated in order to avoid economic loss and environmental damages. It is very important to know the value of the maximum pressure which is critical application to considering in its design for safety and reability. The main purpose of this project is determine remaining strength of corroded pipeline using closed- form solution. New methods which is NEW UMP have been predict and applied compared with other method on difference literature that contain with difference material, gouge length, depth, outer diameter. The results obtained show that the NEW UMP has given the positive result for every criterion that has been test. NEW UMP also predict almost similar and closed with burst pressure value.

Manual for Determining the Remaining Strength of Corroded Pipelines American National Standards Institute 1985

Pipeline Accident Summary Report

Degradation Assessment and Failure Prevention of Pipeline Systems Gabriella Bolzon 2020-09-10 This book presents the results of the research project G5055 'Development of novel methods for the prevention of pipeline failures with security implications,' carried out in the framework of the NATO Science for Peace and Security program, and explores the lifecycle assessment of gas infrastructures. Throughout their service lives, pipelines transporting hydrocarbons are exposed to demanding working conditions and aggressive media. In long-term service, material aging increases the risk of damage and failure, which can be accompanied by significant economic losses and severe environmental consequences. This book presents a selection of complementary contributions written by experts operating in the wider fields of pipeline integrity; taken together, they offer a comprehensive portrait of the latest developments in this technological area.

Federal Register 2000-12-07

Safety and Reliability of Complex Engineered Systems Luca Podofillini 2015-09-03 Safety and Reliability of Complex Engineered Systems contains the Proceedings of the 25th European Safety and Reliability Conference, ESREL 2015, held 7-10 September 2015 in Zurich, Switzerland. It includes about 570 papers accepted for presentation at the conference. These contributions focus on theories and methods in the area of risk, safety and

Manual for Determining the Remaining Strength of Corroded Pipelines/ B31G-2009 American Society of Mechanical Engineers 2009-12-31

Developments in Corrosion Protection Mahmood Aliofkhazraei 2014-02-20 One of the first thing that comes to your mind after hearing the term “corrosion” is corrosion of a metal. Corrosion is a basically harmful phenomenon, but it can be useful in some cases. For instance, environment’s pollution with corrosion products and damage to the performance of a system are among its harmful effects, whereas electric energy generation in a battery and cathodic protection of many structures are among its advantages. However, these advantages are almost nothing as compared to the costs and effects imposed by its detrimental influences. The enormous costs of this phenomenon can be better understand through studying the published statistics on direct and indirect corrosion damages on economy of governments. The direct cost of corrosion is near 3 % of the gross domestic product (GDP) of USA. Considering this huge cost, it is necessary to develop and expand the corrosion science and its protection technologies.

Handbook of Mechanical In-Service Inspection Clifford Matthews 2003-12-30 This comprehensive sister volume to Cliff Matthews’ highly successful Handbook of Mechanical Works Inspection gives a detailed coverage of pressure equipment and other mechanical plant such as cranes and rotating equipment. Key features: Accessible source of information Lavishly illustrated with numerous diagrams, photographs, and tables A wealth of valuable information Detailed, comprehensive coverage Written in easily accessible style A ‘must buy’ reference book The Handbook of Mechanical In-Service Inspection is a vital source of information for: plant owners and operators maintenance engineers inspection engineers from insurance companies and ‘competent bodies’ who perform in-service inspection health and safety operatives engineers operating pressure systems and mechanical plant all those concerned with the safe and efficient operation of machinery, plant, and pressure equipment. All engineering pressure systems and other types of mechanical equipment must be installed, operated, and maintained properly. It must be safe and comply with standards, regulations, and guidelines. In-service inspection is more formally

controlled by statutory requirements than other types of inspection. The Handbook of Mechanical In-service Inspection puts a good deal of emphasis on the ‘compliance’ aspects and the ‘duty of care’ requirements placed on plant owners, operators, and inspectors. The book is suitable for those who operate pressure systems, lifting equipment, and similar mechanical plant are subject to rigorous inspection from external bodies as a matter of course. All operators have a duty to conduct in-service checks and internal inspection procedures to ensure the safe, reliable, and economic running of their equipment.

Title 49 Transportation Parts 178 to 199 (Revised as of October 1, 2013) Office of The Federal Register, Enhanced by IntraWEB, LLC 2013-10-01 49 CFR Transportation

Metallurgy and Corrosion Control in Oil and Gas Production Robert Heidersbach 2018-09-17 Details the proper methods to assess, prevent, and reduce corrosion in the oil industry using today's most advanced technologies This book discusses upstream operations, with an emphasis on production, and pipelines, which are closely tied to upstream operations. It also examines protective coatings, alloy selection, chemical treatments, and cathodic protection—the main means of corrosion control. The strength and hardness levels of metals is also discussed, as this affects the resistance of metals to hydrogen embrittlement, a major concern for high-strength steels and some other alloys. It is intended for use by personnel with limited backgrounds in chemistry, metallurgy, and corrosion and will give them a general understanding of how and why corrosion occurs and the practical approaches to how the effects of corrosion can be mitigated. Metallurgy and Corrosion Control in Oil and Gas Production, Second Edition updates the original chapters while including a new case studies chapter. Beginning with an introduction to oilfield metallurgy and corrosion control, the book provides in-depth coverage of the field with chapters on: chemistry of corrosion; corrosive environments; materials; forms of corrosion; corrosion control; inspection, monitoring, and testing; and oilfield equipment. Covers all aspects of upstream oil and gas production from downhole drilling to pipelines and tanker terminal operations Offers an introduction to corrosion for entry-level corrosion control specialists Contains detailed photographs to illustrate descriptions in the text Metallurgy and Corrosion Control in Oil and Gas Production, Second Edition is an excellent book for engineers and related professionals in the oil and gas production industries. It will also be an asset to the entry-level corrosion control professional who may have a theoretical background in metallurgy, chemistry, or a related field, but who needs to understand the practical limitations of large-scale industrial operations associated with oil and gas production.

Pipeline Safety Regulations United States. Office of Pipeline Safety 1998

Manual for determining the remaining strength of corroded pipelines American National Standards Institute 1991

Code of Federal Regulations, Title 49, Transportation, Pt. 178-199, Revised As of October 1 2012 U S Office of the Federal Register 2014-02-18 The Code of Federal Regulations is a codification of the general and permanent rules published in the Federal Register by the Executive departments and agencies of the United States Federal Government.

A Quick Guide to Pipeline Engineering D Alkazraji 2008-03-26 Pipeline engineering requires an understanding of a wide range of topics. Operators must take into account numerous pipeline codes and standards, calculation approaches, and reference materials in order to make accurate and informed decisions. A Quick Guide to Pipeline Engineering provides concise, easy-to-use, and accessible information on onshore and offshore pipeline engineering. Topics covered include: design; construction;

testing; operation and maintenance; and decommissioning. Basic principles are discussed and clear guidance on regulations is provided, in a way that will prove useful to both engineers and students. Provides concise, easy-to-use, and accessible information on onshore and offshore pipeline engineering Topics covered include design, construction, testing, operation, maintenance and decommissioning Basic principles are discussed and clear guidance on regulations is provided

Maritime Technology and Engineering 5 Volume 1 Carlos Guedes Soares 2021-05-17 This set of two volumes comprises the collection of the papers presented at the 5th International Conference on Maritime Technology and Engineering (MARTECH 2020) that was held in Lisbon, Portugal, from 16 to 19 November 2020. The Conference has evolved from the series of biennial national conferences in Portugal, which have become an international event, and which reflect the internationalization of the maritime sector and its activities. MARTECH 2020 is the fifth of this new series of biennial conferences. The set comprises 180 contributions that were reviewed by an International Scientific Committee. Volume 1 is dedicated to maritime transportation, ports and maritime traffic, as well as maritime safety and reliability. It further comprises sections dedicated to ship design, cruise ship design, and to the structural aspects of ship design, such as ultimate strength and composites, subsea structures as pipelines, and to ship building and ship repair.

Code of Federal Regulations: Transportation 2006-03 The Code of Federal Regulations is a codification of the general and permanent rules published in the Federal Register by the Executive departments and agencies of the United States Federal Government.

Pipeline Risk Management Manual W. Kent Muhlbauer 2004-01-24 Here's the ideal tool if you're looking for a flexible, straightforward analysis system for your everyday design and operations decisions. This new third edition includes sections on stations, geographical information systems, "absolute" versus "relative" risks, and the latest regulatory developments. From design to day-to-day operations and maintenance, this unique volume covers every facet of pipeline risk management, arguably the most important, definitely the most hotly debated, aspect of pipelining today. Now expanded and updated, this widely accepted standard reference guides you in managing the risks involved in pipeline operations. You'll also find ways to create a resource allocation model by linking risk with cost and customize the risk assessment technique to your specific requirements. The clear step-by-step instructions and more than 50 examples make it easy. This edition has been expanded to include offshore pipelines and distribution system pipelines as well as cross-country liquid and gas transmission pipelines. The only comprehensive manual for pipeline risk management Updated material on stations, geographical information systems, "absolute" versus "relative" risks, and the latest regulatory developments Set the standards for global pipeline risk management

Pipeline Integrity Ramesh Singh 2017-04-25 Pipeline engineers, operators, and plant managers are responsible for the safety of pipelines, facilities, and staying on top of regulatory compliance and maintenance. However, they frequently need reference materials to support their decision, and many new pipeline engineers and plant managers are responsible for major repairs and decisions yet do not have the proper reference to set a holistic integrity plan in place. Pipeline Integrity, 2nd Edition delivers necessary pipeline inspection methods, identification of hazard mechanisms, risk and consequence evaluations, and repair strategies. Covering relevant standards and processes for risk, assessment, and integrity management, this go-to reference provides the principles that guide these concepts enhanced with more critical regulatory information and easier organization betwen liquid and gas pipelines. More detailed information is provided on asset reliability, including risk-based inspection and other inspection prioritizing tools such as value-driven maintenance and evidence-based asset management. Pipeline

Integrity, 2nd Edition continues to provide engineers and plants managers a vital resource for keeping their pipelines and facilities safe and efficient. Set an integrity management plan and safe assessment program while properly characterizing impact of risk Get updated with new information on corrosion control, gas and liquid hydrocarbon transportation risk management and asset integrity management Understand and apply all the latest and critical oil and gas pipeline standards, both U.S. and international-based

Remaining Strength Assessment of Deteriorating Energy Pipelines Bipul Chandra Mondal 2018 Pipelines are extensively used as the most economic means of transporting oil and gas. The steel pipelines have been widely used for these applications due to the high strength to weight ratio of the material, resulting in lower material cost. These pipelines are subjected to corrosions during the service life, resulting in the reduction of wall thicknesses. The prediction of the remaining strength of a corroded pipeline is required for fitness-for-purpose assessment. For the prediction of the remaining strength, different models were developed based on simplified results of analysis and/or empirical fits to limited experimental data which are expressed in terms of burst pressure. The established design codes adopt simplified design equations for the burst pressure prediction for corroded pipelines. However, the burst pressures predicted using the simplified equations are not consistent with the burst test results and results obtained from rigorous finite element (FE) analyses. Besides, the pipelines are often subjected to axial force and bending moment. The effects of the axial force and bending moment on the burst pressure are not rationally accounted. In this research, the axial forces and bending moments experience by energy pipelines are first examined considering a case of offshore pipelines. The improved burst pressure models are then developed for pipelines with and without the axial forces and bending moments. The existing models of burst pressures for deteriorated-steel pipelines are investigated to determine the contributing parameters to the burst pressures. The Folias factor and flow stress are identified as the major parameters contributing to the burst pressures of the corroded pipelines. A detailed study, based on FE analysis using Abaqus, has been carried out to develop a new method of defining the Folias factor and to develop an improved model for burst pressure prediction for a corroded pipeline. The finite element analysis is then extended to develop the new interaction rules for the pipelines subjected to multiple patches of the corrosion defects. The FE analysis is used to develop failure loci for burst pressure prediction for pipelines subjected to axial forces and bending moments. Corroded pipelines often suffer from the stress corrosion cracking (SCC) when the pipelines in corrosive environments are subjected to high tensile stresses. The SCC occurs at a stress intensity factor well below the fracture toughness of the material. The effects of the SCC and the crack propagation in the deteriorating pipelines cannot be captured using standard FE modeling techniques. It is proposed to employ fracture mechanics to determine the remaining strengths of pipelines containing corrosion defects or crack-like defects or corrosion with crack-like defects.

Pipeline Safety Regulations United States. Department of Transportation. Research and Special Programs Administration 1998

Pipeline Accident Report

Pipeline Engineering ebook Collection E.W. McAllister 2008-09-05 Pipeline Engineering ebook Collection contains 6 of our best-selling titles, providing the ultimate reference for every pipeline professional's library. Get access to over 3000 pages of reference material, at a fraction of the price of the hard-copy books. This CD contains the complete ebooks of the following 6 titles: McAllister, Pipeline Rules of Thumb 6th Edition, 9780750678520 Muhlbauer, Pipeline Risk Management Manual 3rd Edition, 9780750675796 Parker, Pipeline Corrosion & Cathodic Protection 3rd Edition, 9780872011496 Escoe, Piping & Pipeline

Assessment Guide V1, 9780750678803 Parisher, Pipe Drafting & Design 2nd Edition, 9780750674393 Farshad, Plastic Pipe Systems: Failure Investigation and Diagnosis, 9781856174961 *Six fully searchable titles on one CD providing instant access to the ULTIMATE library of engineering materials for pipeline professionals *3000 pages of practical and theoretical pipeline information in one portable package. * Incredible value at a fraction of the cost of the print books

Proceedings of the 5th International Conference on Electrical Engineering and Automatic Control Bo Huang 2016-07-15 On the basis of instrument electrical and automatic control system, the 5th International Conference on Electrical Engineering and Automatic Control (CEEAC) was established at the crossroads of information technology and control technology, and seeks to effectively apply information technology to a sweeping trend that views control as the core of intelligent manufacturing and life. This book takes a look forward into advanced manufacturing development, an area shaped by intelligent manufacturing. It highlights the application and promotion of process control represented by traditional industries, such as the steel industry and petrochemical industry; the technical equipment and system cooperative control represented by robot technology and multi-axis CNC; and the control and support of emerging process technologies represented by laser melting and stacking, as well as the emerging industry represented by sustainable and intelligent life. The book places particular emphasis on the micro-segments field, such as intelligent micro-grids, new energy vehicles, and the Internet of Things.

Steel Corrosion and Degradation of its Mechanical Properties Chun-Qing Li 2021-09-19 This book presents the state-of-the-art-knowledge on corrosion of steel, cast iron and ductile iron with a focus on corrosion-induced degradation of their mechanical properties. The information presented in the book is largely derived from the most current research on the effect of corrosion on degradation of mechanical properties. The book covers the basics of steel corrosion, including that of cast iron and ductile iron, that are not well covered in most literature. Models for corrosion-induced degradation of mechanical properties are presented in the book with a view to wider applications. The knowledge presented in the book can be used to prevent corrosion-induced failures of corrosion-affected structures, offering enormous benefits to the industry, business, society and community. Key strengths of the book are that it can be employed by a variety of users for different purposes in designing and assessing corrosion-affected structures, and that the knowledge and techniques presented in the book can be easily applied by users in dealing with corrosion-affected structures, and the uniqueness in examining the corrosion effect on degradation of various mechanical properties. Wtih examples of practical applications, the book is particularly useful for all stakeholders involved in steel manufacturing and construction, including engineering students, academicians, researchers, practitioners and asset managers.

Oil and Gas Pipelines R. Winston Revie 2015-04-01 A comprehensive and detailed reference guide on the integrity and safety of oil and gas pipelines, both onshore and offshore Covers a wide variety of topics, including design, pipe manufacture, pipeline welding, human factors, residual stresses, mechanical damage, fracture and corrosion, protection, inspection and monitoring, pipeline cleaning, direct assessment, repair, risk management, and abandonment Links modern and vintage practices to help integrity engineers better understand their system and apply up-to-date technology to older infrastructure Includes case histories with examples of solutions to complex problems related to pipeline integrity Includes chapters on stress-based and strain-based design, the latter being a novel type of design that has only recently been investigated by designer firms and regulators Provides information to help those who are responsible to establish procedures for ensuring pipeline integrity and safety

Code of Federal Regulations 1995

Advances in Energy Science and Equipment Engineering Shiquan Zhou 2015-11-05 Advances in Energy Equipment Science and Engineering contains selected papers from the 2015 International Conference on Energy Equipment Science and Engineering (ICEESE 2015, Guangzhou, China, 30-31 May 2015). The topics covered include:- Advanced design technology- Energy and chemical engineering- Energy and environmental engineering- Energy scien

Risk and Reliability Analysis: Theory and Applications Paolo Gardoni 2017-02-24 This book presents a unique collection of contributions from some of the foremost scholars in the field of risk and reliability analysis. Combining the most advanced analysis techniques with practical applications, it is one of the most comprehensive and up-to-date books available on risk-based engineering. All the fundamental concepts needed to conduct risk and reliability assessments are covered in detail, providing readers with a sound understanding of the field and making the book a powerful tool for students and researchers alike. This book was prepared in honor of Professor Armen Der Kiureghian, one of the fathers of modern risk and reliability analysis.

Manual for Determining the Remaining Strength of Corroded Pipelines American Society of Mechanical Engineers 2012

Code of Federal Regulations, Title 49, Transportation, Pt. 186-199, Revised as of October 1 2009 2010-02-19

The Code of Federal Regulations of the United States of America 1994 The Code of Federal Regulations is the codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the Federal Government.

Safety and Reliability Stian Lydersen 1998

Code of Federal Regulations 49 Transportation Office of the Federal Register 2007 The Code of Federal Regulations is a codification of the general and permanent rules published in the Federal Register by the Executive departments and agencies of the United States Federal Government.

Pipeline Integrity Handbook Ramesh Singh 2013-09-18 Based on over 40 years of experience in the field, Ramesh Singh goes beyond corrosion control, providing techniques for addressing present and future integrity issues. Pipeline Integrity Handbook provides pipeline engineers with the tools to evaluate and inspect pipelines, safeguard the life cycle of their pipeline asset and ensure that they are optimizing delivery and capability. Presented in easy-to-use, step-by-step order, Pipeline Integrity Handbook is a quick reference for day-to-day use in identifying key pipeline degradation mechanisms and threats to pipeline integrity. The book begins with an overview of pipeline risk management and engineering assessment, including data collection and regulatory approaches to liquid pipeline risk management. Other critical integrity issues include: Pipeline defects and corrective actions Introduction to various essential pipeline material such as line pipes and valves Coverage on corrosion and corrosion protection Identifies the key pipeline degradation mechanisms and threats to pipeline integrity Appreciates various corrosion monitoring and control tools and techniques Understands the principles of risk assessment and be able to conduct a simple risk assessment Develops simple Pipeline Integrity Management plans Selects and apply appropriate inspection and assessment criteria for pipeline defects Recommends appropriate repair methods for pipeline defects

Pipeline safety regulations 2005

Diagnostics and Reliability of Pipeline Systems Sviatoslav Timashev 2016-03-17 The book contains solutions to fundamental problems which arise due to the logic of development of specific branches of science, which are related to pipeline safety, but mainly are subordinate to the needs of pipeline transportation. The book deploys important but not yet solved aspects of reliability and safety assurance of pipeline systems, which are vital aspects not only for the oil and gas industry and, in general, fuel and energy industries , but also to virtually all contemporary industries and technologies. The volume will be useful to specialists and experts in the field of diagnostics/ inspection, monitoring, reliability and safety of critical infrastructures. First and foremost, it will be useful to the decision making persons —operators of different types of pipelines, pipeline diagnostics/inspection vendors, and designers of in-line –inspection (ILI) tools, industrial and ecological safety specialists, as well as to researchers and graduate students.

Elastoplastic Behavior of Highly Ductile Materials Maosheng Zheng 2019-10-19 This book mainly introduces some basic phenomena and laws of highly ductile materials during elastoplastic deformation, and their engineering applications, such as the transfer and relief of stress concentration in the notch root, the mitigation of possible brittle fracture, the ductile deformation and damage, fatigue, energy absorption, plastic buckling, thermal stress problems, etc. It shows a number of revolutions in modern applications and design, which are beneficial to the safety of modern equipment, and improve applicability. In addition, the first three chapters of this book also briefly introduce the basic knowledge of elastoplastic deformation and analysis as a preliminary knowledge. This book can be used as a textbook for advanced undergraduate students and postgraduate in non-mechanics majors such as mechanical engineering, power, material or civil engineering, as well as scholars and engineers in related fields.

Pipelines and Risers Yong Bai 2001-02-07 Pipelines and Risers