

# How smart PIGs keep pipelines safe

Smart PIGs are probes that clean and inspect pipelines to prevent leaks and environmental damage. In a natural gas line, PIGs are powered by natural gas pressure pushing them onward. Outfitted with computers, GPS, sensors and magnets that transmit data to engineers, smart PIGs can pinpoint any signs of trouble.

**WHAT THEY LOOK FOR:** Stress, corrosion, gouges, dents and cracks.

**WHY ARE THEY CALLED PIGS?** In addition to being an acronym for **P**ipeline **I**nspection **G**auges, they also make a squealing noise when running through a pipe.

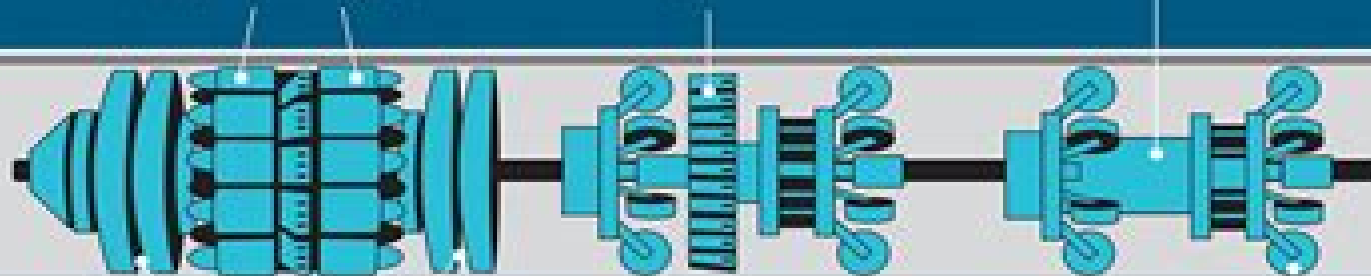
**HOW BIG ARE THEY?** When PIGs are used to inspect Duke Energy natural gas lines, they can be up to 18 feet long and can inspect pipes that are up to 30 inches in diameter.



**PIPE WALL THICKNESS SENSORS**  
are powerful magnets.

**CALIPER SENSORS**  
measures any dents on the pipe.

**BATTERY AND DATA STORAGE CONTAINER**



**DRIVE CUPS**  
for propulsion through the pipe.

**ODOMETER WHEELS**  
keep the PIG centered in the pipe and measure speed and distance traveled.

# Smart Clean Pigs

**Mohammad Reza  
Rahimpour, Mohammad Amin  
Makarem, Maryam Meshksar**

## Smart Clean Pigs:

Smart, Clean Pigs , **Smart, Clean Pigs** Allan Fowler,1993 Briefly describes where pigs live what they look like and how they behave **Natural Gas Pipelines** United States. General Accounting Office,1992 10000000001004000000(1D),2004 Great Smoky Mountains National Park Amy Graham,2008-10-01 Learn about the Great Smoky Mountains National Park s history and varied attractions as well as its resident wildlife **Low pressure liquid pipelines in the North Slope, Greater Prudhoe Bay, Alaska : hearing** , My Friend the Potbellied Pig Joanne Randolph,2010-12-15 Introduces the potbellied pig and provides information on whether to keep one as an indoor pet and on caring for a potbellied pig Daily Warm-Ups: Reading, Grade 3 Shelle Russell,2006-05-11 Each book in the Daily Warm Ups Reading series provides students with over 150 opportunities to master important reading skills The warm ups include both fiction and nonfiction reading passages followed by questions that are based on Bloom s Taxonomy to allow for higher level thinking skills Book jacket

**The Safety of Hazardous Liquid Pipelines: Regulated Vs. Unregulated, ... (111-124), June 29, 2010, 111-2 Hearing, \*** ,2011 *Pipeline Planning and Construction Field Manual* E. Shashi Menon,1978-06-26 Pipeline Planning and Construction Field Manual aims to guide engineers and technicians in the processes of planning designing and construction of a pipeline system as well as to provide the necessary tools for cost estimations specifications and field maintenance The text includes understandable pipeline schematics tables and DIY checklists This source is a collaborative work of a team of experts with over 180 years of combined experience throughout the United States and other countries in pipeline planning and construction Comprised of 21 chapters the book walks readers through the steps of pipeline construction and management The comprehensive guide that this source provides enables engineers and technicians to manage routine auditing of technical work output relative to technical input and established expectations and standards and to assess and estimate the work including design integrity and product requirements from its research to completion Design piping civil mechanical petroleum chemical project production and project reservoir engineers including novices and students will find this book invaluable for their engineering practices Back of the envelope calculations Checklists for maintenance operations Checklists for environmental compliance Simulations modeling tools and equipment design Guide for pump and pumping station placement *Low Pressure Liquid Pipelines in the North Slope, Greater Prudhoe Bay, Alaska* United States. Congress. House. Committee on Transportation and Infrastructure,2007 **Implementation of the Pipeline Inspection, Protection, Enforcement and Safety Act of 2006 and Reauthorization of the Pipeline Safety Program** United States. Congress. House. Committee on Transportation and Infrastructure. Subcommittee on Railroads, Pipelines, and Hazardous Materials,2010 **Industrial Pigging Technology** Gerhard Hiltcher,Wolfgang Mühlthaler,Jörg Smits,2006-12-13 Pigs are snug fitting plugs which are able to perform various maintenance tasks such as cleaning or removing deposits or blockages in pipe and pipeline systems from the inside A gaseous or liquid propellant is used to push the pig through the system This

strategy avoids rinsing loss of valuable product provides reduction of adverse environmental impacts and gains high efficiency for less investment The book describes clearly and methodically the important basic equipment required for the planning and design of pigging units Many practical examples are shown for the operation of industrial pigging units drawn from the authors longtime experience in this technology In this form and scope the book is an unrivaled presentation of this technology Engineers and chemists who plan construct operate and maintain production plants in the chemical food cosmetics pharmaceutical and petrochemical industry will find an invaluable source of advice and reference for pigging units

**Advances in Natural Gas: Formation, Processing, and Applications. Volume 6: Natural Gas Transportation and Storage** Mohammad Reza Rahimpour, Mohammad Amin Makarem, Maryam Meshksar, 2024-04-04 Advances in Natural Gas Formation Processing and Applications is a comprehensive eight volume set of books that discusses in detail the theoretical basics and practical methods of various aspects of natural gas from exploration and extraction to synthesizing processing and purifying producing valuable chemicals and energy The volumes introduce transportation and storage challenges as well as hydrates formation extraction and prevention Volume 6 titled Natural Gas Transportation and Storage is separated into three sections The first section discusses different natural gas transportation technologies such as LNG CNG ANG GTS etc The second section introduces related apparatus for natural gas transportation and storage including measurement systems compressors pumps etc as well as pipelines and controlling equipment The last section explains challenges of natural gas transmission including inhibition of pipeline corrosion cracking and wax deposition accompanied with pipeline cleaning challenges Introduces various natural gas transportation technologies LNG CNG ANG Describes different apparatus for natural gas transportation and storage Includes various challenges of natural gas transportation such as pipeline corrosion and wax deposition

*The Safety of Hazardous Liquid Pipelines* United States. Congress. House. Committee on Transportation and Infrastructure. Subcommittee on Railroads, Pipelines, and Hazardous Materials, 2010

**Food Choice and Sustainability** Dr. Richard Oppenlander ,2013 Food choice and sustainability tackles the critical issue of the global depletion of our natural resources drawing attention to what might seem an unlikely spot our dinner plates

*BP's Pipeline Spills at Prudhoe Bay* United States. Congress. House. Committee on Energy and Commerce. Subcommittee on Oversight and Investigations, 2006

Rust Jonathan Waldman, 2015-03-10 Finalist for the Los Angeles Times Book Prize A Wall Street Journal Best Book of the Year Rust has been called the great destroyer the pervasive menace and the evil This look at corrosion its causes its consequences and especially the people devoted to combating it is wide ranging and consistently engrossing The New York Times It is the hidden enemy the one that challenges the very basis of civilization This entropic menace destroys cars fells bridges sinks ships sparks house fires and nearly brought down the Statue of Liberty s torch It is rust and this book full of wit and insight disasters and triumphs is its story Jonathan Waldman s first book is as obsessive as it is informative he takes us deep into places and situations that are too often ignored or unknown The Washington Post In Rust

Waldman travels from Key West to Prudhoe Bay meeting people concerned with corrosion He sneaks into an abandoned steelworks and nearly gets kicked out of Can School He follows a high tech robot through an arctic winter hunting for rust in the Alaska pipeline In Texas he finds a corrosion engineer named Rusty and in Colorado he learns of the animosity between the galvanizing industry and the paint army Along the way Waldman recounts stories of flying pigs Trekkies rust boogers and unlikely superheroes The result is a man versus nature tale that is as fascinating as it is grand illuminating a hidden phenomenon that shapes the modern world Rust affects everything from the design of our currency to the composition of our tap water and it will determine the legacy we leave on this planet This exploration of corrosion and the incredible lengths we go to fight it is engrossing brilliant Waldman's gift for narrative nonfiction shines in every chapter Watching things rust who would have thought it could be so exciting Natural History

*Valves, Piping, and Pipelines Handbook* T. Christopher Dickenson, 1999 Hardbound Over recent years a number of significant developments in the application of valves have taken place the increasing use of actuator devices the introduction of more valve designs capable of reliable operation in difficult fluid handling situations low noise technology and most importantly the increasing attention being paid to product safety and reliability Digital technology is making an impact on this market with manufacturers developing intelligent smart control valves incorporating control functions and interfaces New metallic materials and coatings available make it possible to improve application ranges and reliability New and improved polymers plastic composite materials and ceramics are all playing their part Fibre reinforced plastic pipe systems glass reinforced epoxy pipe systems and the traditional low cost polyester pipe systems have all undergone sophisticated design and manufacturing technology changes The pote

**Mitigation of Gas Pipeline Integrity Problems** Mavis Sika Okyere, 2020-10-04 Mitigation of Gas Pipeline Integrity Problems presents the methodology to enable engineers experienced or not to alleviate pipeline integrity problems during operation It explains the principal considerations and establishes a common approach in tackling technical challenges that may arise during gas production Covers third party damage corrosion geotechnical hazards stress corrosion cracking off spec sales gas improper design or material selection as built flaws improper operations and leak and break detection Details various hazard mitigation options Offers tested concepts of pipeline integrity blended with recent research results documented in a scholarly fashion to make it simple to the average reader This practical work serves the needs of advanced students researchers and professionals working in pipeline engineering and petrochemical industries

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