

*Proceedings of the*  
**ASME-ARPEL INTERNATIONAL PIPELINE  
GEOTECHNICAL CONFERENCE  
- 2019 -**

---

**IPG2019**

presented at  
2019 ASME-ARPEL INTERNATIONAL PIPELINE GEOTECHNICAL CONFERENCE  
JUNE 25-27, 2019  
BUENOS AIRES, ARGENTINA

sponsored by  
PIPELINE SYSTEMS DIVISION, ASME

**THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS  
Two Park Avenue \* New York, NY. 10016**

Printed from e-media with permission by:

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Statement from By-Laws: The Society shall not be responsible for statements or opinions  
Advanced in papers. . .or printed in its publications (7.1.3)

INFORMATION CONTAINED IN THIS WORK HAS BEEN OBTAINED BY ASME FROM SOURCES BELIEVED TO BE RELIABLE. HOWEVER, NEITHER ASME NOR ITS AUTHORS OR EDITORS GUARANTEE THE ACCURACY OR COMPLETENESS OF ANY INFORMATION PUBLISHED IN THIS WORK. NEITHER ASME NOR ITS AUTHORS AND EDITORS SHALL BE RESPONSIBLE FOR ANY ERRORS, OMISSIONS, OR DAMAGES ARISING OUT OF THE USE OF THIS INFORMATION. THE WORK IS PUBLISHED WITH THE UNDERSTANDING THAT ASME AND ITS AUTHORS AND EDITORS ARE SUPPLYING INFORMATION BUT ARE NOT ATTEMPTING TO RENDER ENGINEERING OR OTHER PROFESSIONAL SERVICES. IF SUCH ENGINEERING OR PROFESSIONAL SERVICES ARE REQUIRED, THE ASSISTANCE OF AN APPROPRIATE PROFESSIONAL SHOULD BE SOUGHT.

For authorization to photocopy material for internal or personal use under circumstances not falling within the fair use provisions of the Copyright Act, contact the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923, Tel: 978-750-8400

Requests for special permission or bulk reproduction should be addressed to [permissions@asme.org](mailto:permissions@asme.org).

**ISBN NO. 978-0-7918-5911-7**

**© 2019 ASME**

**All rights reserved.**

**Printed in U.S.A with permission by Curran Associates, Inc. (2020)**

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2633  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# CONTENTS

## IPG2019

### GEOHAZARD CONSIDERATIONS FOR DESIGN AND CONSTRUCTION PIPELINE ROUTE SELECTION AND CHARACTERIZATION

**IPG2019-5336**..... **V001T01A001**  
Utilisation of Sheet Piles in the OCENSA's Right of Way for Slope Stabilisation and  
Bioengineering Works  
*Hugo Garcia*

**IPG2019-5343**..... **V001T01A002**  
A New Approach for the Geotechnical Zoning of the Rights of Way  
*Julian Chaves Agudelo, Jaime Aristizabal Ceballos, Carlos Motta Tierradentro, Juan Alvarado  
Franco*

### GEOHAZARD RISK ASSESSMENT AND PIPELINE INTEGRITY MANAGEMENT PLANNING

**IPG2019-5301**..... **V001T02A001**  
Retroerosion in a TBG Gas Pipeline Crossing and its Rehabilitation  
*Cesar Augusto Costa, Walter Schultz Neto, Thiago Wichrestink Zozula*

**IPG2019-5314**..... **V001T02A002**  
Watercourse Crossing Program: 10 Years Performance  
*Gerald Ferris, Sarah Newton, Minh Ho*

**IPG2019-5321**..... **V001T02A003**  
Cost Optimisation in Risk Reduction Management Based on Gross Disproportionation  
Concept  
*Alejandro Marin, Jon Hernandez*

**IPG2019-5325**..... **V001T02A004**  
An Analytical Approach for Pipeline Geohazard Management  
*Otto Huisman, Moness Rizkalla, Matt Tindall, Alejandro Reyes, Erika Santana*

**IPG2019-5327**..... **V001T02A005**  
Risk Management of Pipeline Breakage at River Crossings Through Quantitative  
Analysis of the Threat, Vulnerability and Consequences  
*Carlos Debandi, Fernando Martearena, Natalia Roth*

**IPG2019-5328**..... **V001T02A006**  
Assessing and Managing Geologic Hazards in the Appalachian Region of the United  
States  
*Martin P. Derby, Bailey Theriault*

**IPG2019-5339**..... **V001T02A007**  
Finite Element Modelling of a Series of Ground Displacement Episodes and Stress Relief Procedures  
*Hamid Karimian, Pete Barlow, Chris Blackwell, Chris Campbell*

**IPG2019-5342**..... **V001T02A008**  
Natech Risk Management on Pipelines of Cenit  
*Jaime Aristizabal Ceballos, Julian Fernando Chaves Agudelo, Carlos Eduardo Motta Tierradentro, Maria Isabel Montoya Rodriguez*

**IPG2019-5346**..... **V001T02A009**  
Enhancing Geohazard Management Practice for South American Pipelines  
*Michael Porter, Elisa Scordo, Pete Barlow, Daniela Welkner, Miguel Leach*

### **MONITORING, MITIGATION, AND EMERGENCY REPAIRS**

**IPG2019-5303**..... **V001T03A001**  
Oil Pipeline Geohazard Risk Mitigation via On-Line Optical Fiber Strain Monitoring  
*Alexis Mendez, Andres Salazar Ferro*

**IPG2019-5304**..... **V001T03A002**  
Field Data Collection Using GIS Technology for the Management of Geohazards and Third-Party Damage Threats in the Pipeline Transportation System of Natural Gas (NG) and Natural Gas Liquids (NGL)  
*Karin Oviedo, John Erick Malpartida Moya*

**IPG2019-5312**..... **V001T03A003**  
Risk Control Through Evaluation of Catastrophic Scenarios  
*Jose Vicente Amortegui Gil*

**IPG2019-5313**..... **V001T03A004**  
Interferences by Third Parties: The Challenge of the Construction of Highways on the Right of Way of Oil Pipelines -- Case of Autopistas Del Nordeste-Ocensa  
*Julian Javier Corrales Cobos*

**IPG2019-5320**..... **V001T03A005**  
River Crossings: Developing a Mobile GIS Approach to Monitoring Activities  
*Martin Carnicero, Maureen Vazquez*

**IPG2019-5324**..... **V001T03A006**  
Monitoring and Screening of Pipelines for Movement: A Fast and Cost-Effective Alternative for Pipeline Operators to Measure Drift in Pipelines  
*Michael Schorr, Klaas Kole, Ferdinand Foessing*

**IPG2019-5332**..... **V001T03A007**  
Simple Method for DTS/DSS Data Interpretation: An Application to Pipeline Geotechnical Monitoring  
*Fabien Ravet, Sanghoon Chin, Fabien Briffod, Etienne Rochat*

**IPG2019-5333**..... **V001T03A008**  
Ground Based Interferometric Synthetic Aperture Radar Combined With a Critical  
Slope Monitoring Program Will Provide Early Detection of Slope Movement Along  
Pipeline Corridors  
*Steven E. Borron, Martin P. Derby*

**IPG2019-5344**..... **V001T03A009**  
Learnings About Geohazards in Cenit Pipeline Integrity Management  
*Carlos Motta Tierradentro, Jaime Aristizabal Ceballos, Julian Chaves Agudelo, Camilo Eliecer  
Torres Castro*