

## Received Abstracts

(122 abstracts as of March 31)

**Represented Countries (12):** Australia, Brazil, Canada, Chile, Colombia, Costa Rica, Ecuador, India, Mexico, Peru, Spain and United States

### Digital transformation management and economic evaluation

(13 abstracts)

1. **(A27) IA aplicada y SAP como habilitadores de un CIO: gestión del conocimiento operacional para decisiones en Supply Chain**  
Fernando Frederick, NovaAndino, Chile
2. **(A39) Obsolescence to resilience: modernization and increased reliability in industrial automation**  
Karine Oliveira and Victor Siqueira, Vale, Brazil
3. **(A47) Integrated metallurgical data from laboratory to pilot for continuous interpretation**  
Sandy Prieto and Ryan Monteith, SGS Canada
4. **(A50) Real-time optimized control of feeder systems in an industrial iron ore screening circuit**  
Mário Guimarães, Thiago Pantuza, Eric Baeta, Tiago Caixeta and Jesus Dias, Vale, Brazil
5. **(A75) Integración de control MPC con lógica carro tripper para optimización en líneas acidificación**  
Patricio Varas, Carlos Yanten, Pablo Karelovic y Felipe Arriagada, Honeywell, Chile; Jonathan Aqueveque, Victor Gómez y Francisco Poblete, Codelco, Chile
6. **(A80) Trazabilidad digital de insumos críticos: Gestión eficiente del abastecimiento en compañía minera**  
Rolando Jofré, Antara Solutions, Chile
7. **(A84) Digital product thinking as a strategy for PPM platform adoption in mining capital projects**  
Priscila Lobo Ferreira, Vale, Brazil
8. **(A86) Plataforma de modelamiento y visualización en tiempo real para mejora operacional desde centro de operaciones remoto**  
Katherine Muñoz, Anglo American, Chile y Joaquín Laínez, TIMining, Chile
9. **(A93) Obsolescence to resilience: modernization and increased reliability in industrial automation**  
Karine Oliveira and Victor Siqueira, Vale, Brazil
10. **(A108) Ajuste dinámico de las velocidades basado en calidad del concentrado por línea para mineral de hierro**  
Felipe Moreno, Honeywell, Chile; Matheus Moreira, Anglo American, Brasil y Sergio Rubilar, Anglo American, Chile
11. **(A113) Green Copper: integración OT-IT para optimización metalúrgica y gestión del agua**  
Emilio Huamán, EH Consulting Lat, Perú

**12. (A114) Mapping data fragmentation costs to digital twin investment viability in mining**

Guilherme Klein and Tadeu Martins, Siemens, Brazil

**13. (A116) Monitoreo remoto para la confiabilidad de activos en pozos de agua en zonas remotas: cumplimiento normativo y optimización operativa**

Jorge Espinoza, Emerson, Costa Rica

**Artificial intelligence applications: machine learning, NLP, computer vision, deep learning and advanced robotics engineering**

(33 abstracts)

**1. (A08) Automated core image analysis for geotechnical characterization in brownfield mining environments**

Luis Yanez, Datarock-IMDEX, Australia and Elizabeth Askew, Stawell Gold Mines, Australia

**2. (A14) Ecosistema Angelis: la latencia operacional como nueva variable crítica de productividad en minería**

Alex Vicencio, Angelis, Chile

**3. (A16) Implementación de modelos de *deep learning* para la predicción de arcillas en la planificación minera**

Pablo Vega, Ricardo Krefte, Valentina Elgueta, Cesar Briceño, Carlos Barrio, Julian Ravanal y Javier Inostroza, Codelco, Chile; Tomás Rodríguez, Jacqueline Harris, Pablo Soto y Maximiliano Contreras, Mineral Forecast, Chile

**4. (A20) UAV-AI framework for inferring subsurface fragmentation using AI-modeled surface metrics**

N Sri Chandrabhas and Ravi Sahu, Strayos, India

**5. (A21) Transforming mining reliability through predictive maintenance at scale**

Abraham Ortiz, Emerson, Mexico and Joao Pedro Almeida, Emerson, Brazil

**6. (A25) Data-driven identification and performance evaluation of sag mill operating modes using ensemble clustering**

Darshil Patel and Mauricio Mathey Garcia-Rada, Asarco, USA

**7. (A32) AI-assisted knowledge access for maintenance personnel in heterogeneous mining fleets**

Veronica Gacitua, Ribbeon, USA; and Claudio Gacitua, Innovaengine, Chile

**8. (A34) Accelerating geological domain definition through AI in an integrated modeling environment**

José González, Dassault Systèmes, Chile; Olga Reshetnikova, Dassault Systèmes, Brazil; and Isabella Buitrago, Dassault Systèmes, Colombia

**9. (A37) Soft sensor for data complementation in tailing dam piezometers**

Tiago Silva and Gustavo Pessin, Instituto Tecnológico Vale, Brazil; and Adrielle Santana, Universidade Federal de Ouro Preto, Brazil

**10. (A42) Dam breach detection using water level variation rate: threshold definition and experimental validation**

André Paiva and Alan Kardek Rêgo Segundo, Universidade Federal de Ouro Preto, Brazil; and Gustavo Pessin, Instituto Tecnológico Vale, Brazil

- 11. (A44) Power prediction in grinding using hybrid models and time-series architectures**  
María José Astudillo, Fernanda Barrera, Cristian Vernet, Matias Mansoulet and Brian Vivero, Molycop, Chile; and Paul Shelley, Molycop, Australia
- 12. (A46) Journey to Autonomous: enhance productivity and situational awareness with DeltaV AI**  
Curtis Thompson and Sharon McCurdy, Emerson, USA
- 13. (A48) Data-Driven prediction of pipeline head loss for proactive pigging planning**  
Daniel Fartes, Ausenco, Brazil, and Vicente Sepúlveda, Ausenco, Chile
- 14. (A57) Plataforma digital para revisión y auditoría de modelos BIM aplicada al diseño de plantas del mercado minero**  
Miguel Angel Barraza y Juan José Ramos, WSP, Chile
- 15. (A58) Analysis of critical features importances in tailings and waste rock piles using ensemble learning models**  
Sueli Silva, Claudio Resende, Kelson Figueiredo, Thayane Simoes, Celso Romanel, and Roberto Quevedo, Pontifícia Universidade Católica do Rio de Janeiro, Brazil
- 16. (A60) Implementación de modelo de video analítica para monitoreo de pilas de lixiviación en División Chuquicamata**  
Camila Albornoz, Diego Vergara, Mauricio Pozo, Juan Pablo Hasche, Martín Campos, Camilo Menares y Francisca Miranda, Codelco, Chile
- 17. (A61) Hybrid artificial intelligence pipeline for extreme rainfall forecasting and alert system in geotechnical monitoring of mining operations**  
Sueli Silva, Samarco Mineração, Brazil, and Amanda Guimarães, Instituto Euvaldo Lodi, Brazil
- 18. (A65) Q-learning-based soft sensor for adjusting silo fill rates in the tripper car scheduling**  
Lucas Reis and Luciano Cota, Vale, Brazil; and Marcone Souza, Universidade Federal de Ouro Preto, Brazil
- 19. (A69) Artificial intelligence in railway systems: computational optimization for efficient monitoring**  
Luísa Ferreira, Thomás Pinto and Gustavo Pessin, Instituto Tecnológico Vale, Brazil; and Francisco Diniz, Universidade de São Paulo, Brazil
- 20. (A70) A machine learning approach for fault detection in hydraulic cylinders**  
Niliken Silva, Luísa Ferreira, Thomás Pinto and Gustavo Pessin, Instituto Tecnológico Vale, Brazil; and Francisco Diniz, Universidade de São Paulo, Brazil
- 21. (A71) Application of machine learning algorithms for the prediction of iron content in tailing from flotation**  
Edmar Brito, Universidade Federal de Ouro Preto, Brazil; Iranildes Santos, Thomás Pinto and Gustavo Pessin, Instituto Tecnológico Vale, Brazil; and Tiago Caixeta, Vale, Brazil
- 22. (A96) Artificial intelligence for asset health and performance management**  
Daniela Andrade and Bruno Balbi, EY, Brazil and Gabriela Castro, Alexandre Pigatti, Nikolas Oliveira, Rodrigo Martins and Maria Sousa, Vale, Brazil

**23. (A97) SIRIEMA: a scalable industrial computer vision framework for mining operations**

Rodrigo Paiva, Brenda Moura, Álvaro Martins, Ralf Filho, Tiago Wirtti, Claudio Ramalho and Vitor Ohnesorge, Vale, Brazil; Rodrigo Mendes, Deloitte, Brazil; Rodrigo Fardin, Mogai, Brazil; and Caio Carletti, Tata Consultancy Services, Brazil

**24. (A100) Monitoreo automatizado de flotación de sulfuros mediante IA basada en visión computacional**

Karla Espinosa y Cristina Tubón, Universidad Central del Ecuador

**25. (A102) Data fusion of oil analysis and telemetry for health assessment of off-highway mining trucks**

Brenda Moura and Rodrigo José de Paiva, Vale, Brazil

**26. (A103) Multi-sensor anomaly detection for predictive maintenance of vibrating screens and belt conveyors in mining**

Brenda Moura and Rodrigo José de Paiva, Vale, Brazil

**27. (A104) Multimodal inference framework for surface moisture detection in iron ore rail wagons**

Brenda Moura, Gustavo Maia, Cassius Zanetti, and Leonardo Scardua, Instituto Federal de Educação, Ciência e Tecnologia do Espírito Santo, Brazil; and Rodrigo José de Paiva, Vale, Brazil

**28. (A105) Hybrid artificial intelligence pipeline for extreme rainfall forecasting and alert system in geotechnical monitoring of mining operations**

Sueli Silva, Samarco Mineração, Brazil and Amanda Guimarães, Instituto Euvaldo Lodi, Brazil

**29. (A106) Sistema multi-experto para priorización de alertas CAS y análisis espacial de riesgo de colisión**

Anthony Gutarra Sanchez y A. Olarte, Hexagon, Peru; A. Franca, H Goncalves y Ruda Martins, Hexagon, Brasil

**30. (A107) Digital Shadow basado en telemetría CAS para priorización de riesgos y análisis operacional**

Anthony Gutarra y A. Olarte, Hexagon, Peru; H Goncalves and Ruda Martins, Hexagon, Brasil

**31. (A120) Integration of geometallurgy and AI for predictive and real-time optimization in mineral processing**

Teixeira, Henrique Gonçalves, Glauber Lopes Bomtempo, and Giovanni Felice Salierno, Samarco Mineração, Brazil; and Matheus La Guardia Lara De Castro, Progen, Brazil

**32. (A121) Optimización y mejoras en la seguridad del ciclo de carguío mediante el uso del sistema de analítica operacional basado en visión computacional**

Sergio Lagos, Jorge Skeet, Manuel Zamorano y Sebastián Vergara, PSINet, Chile

**33. (A122) Plataforma de inteligencia operacional para soporte de decisión en minería**

Eduardo Riquelme, Andritz, Chile

## Industrial networks and communications

(01 abstract)

**1. (A117) Transformación digital en minería: redes inalámbricas como base para inteligencia artificial y calidad de datos**

Jorge Espinoza, Emerson, Costa Rica

## OT-IT convergence and integration

(06 abstracts)

1. **(A06) Convergencia OT-IT en minería habilitada por Ethernet-APL y plataformas IIoT**  
Rodrigo Assman, Endress+Hauser, Chile
2. **(A40) Reframing OT connectivity for digital mining: a service-oriented reference architecture**  
Wallace Carvalho and Wendelling Andrade, Accenture, Brazil; and Priscila Guedes, Vale, Brazil
3. **(A43) Integrated data architecture for real-time monitoring and analytics in mining drilling**  
Luis Messa and Francisco Guerra, Southern Peru Copper Corporation, Peru
4. **(A54) Convergencia OT-IT en minería LATAM: integración de datos geotécnicos para operaciones seguras y eficientes**  
Charleston De Oliveira, Filipe Ferreira y Ricardo Marcel, Intelltech Intelligent Technologies, Brasil; y Glendy Suarez, Intelltech Intelligent Technologies, Chile
5. **(A91) Automatización y gestión inteligente del riego en pilas de lixiviación: la evolución a un enfoque SaaS**  
Luis Felipe Escobar, Ingeniería Wiseconn, Chile y Jorge Menacho, De Re Metallica, Chile
6. **(A111) Ciberseguridad Industrial en sistemas OT y DCS en operación: integración progresiva basada en IEC62443**  
Ricardo Pozo Font, Inprint, Chile y María Taberna, Steryon, Spain

## Data mining, IoT, and cloud computing

(05 abstracts)

1. **(A15) IoT-based GNSS Infrastructure for scalable positioning in surface mining assets operations**  
Luis Camargo, Federal Institute of Education, Science and Technology of Rio Grande do Sul, Brazil; Eduardo Borges, Paulo Braga, Wesley Camilo, Bruno Vicentini, Bruno Ogando, Danilo de Lima, Felipe Silva, Federal University of Lavras, Brazil; Claudio Dal Col and Bruna Ferreira, Vale, Brazil
2. **(A49) Integrated IoT and cloud analytics architecture for geotechnical monitoring**  
Yaser Alsakaji, Willian Barbao, and Charleston Bezerra, Intelltech Intelligent Technologies, Brazil
3. **(A64) Modelación de pilas mezcla para la gestión de humedad y reducción de atollos en Planta PTMP de la gerencia extracción y lixiviación de DCH**  
Alonso Figueroa, Gonzalo Farías, Valentina Elgueta, Diego Tarazona y Luis Barboza, Codelco, Chile
4. **(A92) Sistema de tracking y control de acceso con IA para minería**  
Terry Fernandez y Edwin Fernandez, New Project Perú
5. **(A109) Integración OAS-CAS por asociación temporal fatiga-colisión para identificar operadores de riesgo**  
Anthony Gutarra y A. Olarte, Hexagon, Peru; Ruda Martins, Hexagon, Brazil

## Smart equipment and operational hardware

(06 abstracts)

1. **(A12) Integrated system for automated dam failure detection and siren activation**  
Pâmela Leite and Anderson Fernandes, Geomin Tecnologia, Brazil
2. **(A22) Alto rendimiento de GPS en P&T con soporte en gemelo digital**  
Gabriel Ibarra y Alexis Troncoso, Geocom, Chile
3. **(A87) Optimization of swing-angle control in ERS 7495 to improve loading efficiency**  
Gilney de Freitas Rodrigues, Talitta Aryanne Marinho Aarão, and Aline Cristina Campos Costa, Vale, Brazil
4. **(A89) Smart cable reeling in electric shovels: field results on productivity and safety**  
Gilney de Freitas Rodrigues, Vale, Brazil
5. **(A98) Geometric control strategies to prevent tight-alignment events in electric rope shovels**  
Gilney de Freitas Rodrigues, Vale, Brazil
6. **(A115) Optimizing through data: fragmentation monitoring**  
Matías Castro, Sebastian Fuentes, Rodrigo Veliz, Fernando García and Felipe Moroni, Orica, Chile; and Juan Aravena, Teck, Chile

## Modeling, optimization, and advanced process control

(33 abstracts)

1. **(A02) A Data-driven approach to the electroleaching treatment of waste streams in the WATERPROOF project**  
Guillermo Pozo, Carmen del Rio, Eider Martin, Maider Azpeitia, Ainhoa Unzurrunzaga, Javier Nieto and María Fernandez, Tecnalía, Spain
2. **(A03) Simulación simplificada de línea de flotación para identificación y control multivariable predictivo**  
Walter Eskuche, Automation, Chile
3. **(A07) Novel soft-sensor-enhanced MPC for moisture control in an iron ore fines dryer for green briquette**  
Gercilio Zuqui, Alex Veronez and Alexandre Stelzer, Vale, Brazil; Vinicius Duarte and Sandro Sodré, ABB, Brazil
4. **(A11) Optimizing maintenance strategies for geotechnical monitoring systems using NSGA-II**  
Giovanna Rocha and Marília Melo, Vale, Brazil, and Homero Castro, Thaís Menegaldi and Michel Bessani, Universidade Federal de Minas Gerais, Brazil
5. **(A13) Leveraging equipment performance data to enhance uncertainty-aware mine planning**  
Sylvester Avane, Angelina Anani and Nathalie Risso, University of Arizona, USA
6. **(A17) Use of advanced tools for vibration modeling and blasting optimization to minimize community impacts**  
João Pedro Marinho and Vitor Barcelos, Orica, Brazil; and Eduardo Eloi, Vale, Brazil

- 7. (A18) Automatización inteligente y analítica avanzada para la continuidad operacional en minería**  
Sergio Molina, Intico Mining, Chile
- 8. (A19) Rescreening III rate control**  
Mateus Filipe Silva, Camila Ribeiro Carneiro, Kaike Albuquerque, Mario Sergio Santos, Vinicius Antonio Ferreira, and Hugo Camargo, Vale, Brazil
- 9. (A23) Early detection of excess fines and emission risks in pelletizing using a soft sensor**  
Gercilio Zuqui, Palmira Santos, Ederson Haagensen and Rony Vieira, Vale, Brazil; and Franklin Lopes, IHM, Brazil
- 10. (A24) Implementation of a new control and interlocking strategy to improve safety and reliability in a thickener valve system**  
Vinicius Ferreira, Mateus Filipe, Kaike Albuquerque, Camila Carneiro, Henrique Diniz Rocha and Elder Júnior, Vale, Brazil
- 11. (A28) Cuantificación de yodo en línea mediante XRF como variable de entrada para APC en procesos de recuperación desde salmueras**  
Pedro Maldonado, SAX Sistemas Analíticos, Chile; Leonardo Gutiérrez y Francisco Cabrera, Sociedad Química y Minera de Chile
- 12. (A29) Autonomous crushing: automation and control in crushing and screening processes**  
Mário Sérgio Santos, Alexandre Gomes Fonseca, Cássio Pascoal Costa, Daniel Luiz de Souza, Gabriel Duarte Lott, Kaike Silva Albuquerque and Pedro Henrique de Moura Couto, Vale, Brazil
- 13. (A30) Real-time optimized control of feeder systems in an industrial iron ore screening circuit**  
Mário Guimarães, Thiago Pantuza, Eric Baeta, Tiago Caixeta, and Jesus Dias, Vale, Brazil
- 14. (A33) Model agnostic predictive analytics and multi-indenture availability optimization for mining**  
Veronica Gacitua, Ribbeon, USA and Claudio Gacitua, Innovaengine, Chile
- 15. (A35) An integrated framework for strategic mine planning and multimine optimization**  
Isabella Buitrago, Dassault Systèmes, Colombia; Magdiel Alfaro, Solaer, Chile; Olga Reshetnikova, Dassault Systèmes, Brazil; and José González, Dassault Systèmes, Chile
- 16. (A36) Process optimization: integrating between milling and flotation process**  
Gabriel Duarte, Bárbara Bulgarelli Alves de Aguiar, Cássio Pascoal Costa, Graciana de Souza Oliveira, Mário Sérgio dos Santos, Mateus Filipe Silva and Pedro Henrique de Moura Couto, Vale, Brazil
- 17. (A41) Metallurgical accounting in a large production chain**  
Italo Figueiredo de Paula and Jedson Alessandro Damasceno, Samarco Mineração, Brazil; William Barbosa and Paulo Sérgio de Oliveira, TAGNA Tecnologia, Brazil
- 18. (A52) Continuous monitoring and energy-efficient dispatch of parallel pumps in a mine water transportation system**  
Pablo Vergara Colmann, Pablo Monsalve and Gerson Bastos, Ausenco, Chile
- 19. (A55) Ball charge replenishment analysis in rotary mills through data-driven approaches**  
Moises Bustamante, Juan Pablo Cedillo and Jian Yang, Universidad Nacional de Colombia

- 20. (A62) Fuzzy expert system for level control in the iron ore flotation process**  
Lucas Reis and Rafaela Reis, Vale, Brazil; Jeferson Reis and Jonas Assis, IHM Stefanini, Brazil
- 21. (A63) Reduction of surcharge in yard reclaimers using soft sensors in systems with variable delay**  
Lucas Reis, Rafaela Reis and Eduardo Maciel, Vale, Brazil; and Jonas Assis, IHM Stefanini, Brazil
- 22. (A66) Scaling autonomous crushing: from pilot implementation to a structured transformation program**  
Juliene Oliveira, Gabriel Lott, and Luiz Rogério de Freitas Junior, Vale, Brazil; and Wendelling Andrade and Paulo Cruz, Accenture, Brazil
- 23. (A67) NMP Optimizer: alineando la estrategia con la operación de la concentradora**  
Robert von Loebenstein Manzur, Andritz, Chile
- 24. (A73) Simulación dinámica multipropósito habilitando control inteligente y operaciones más autónomas en minería**  
Neliana D´Alessandri y Juan Barona, Schneider Electric, Chile
- 25. (A74) Terrestre Altiplano: optimización exacta del despacho de flotas de camiones de extracción para una orquestación prescriptiva en tiempo real**  
Geff Lang, Terrestre, Chile
- 26. (A78) Beyond the froth: digital control non-visual flotation systems**  
Tuhin Banerjee, Jasper Schaffer and David Hatton, Woodgrove Technologies, Canada
- 27. (A81) Bayesian optimization-based tuning of PID controllers for cone crusher chamber level control**  
Anderson de França Silva, Federal Institute of Education, Science and Technology of Pará, Brazil; Gilney de Freitas Rodrigues, José Manuel Gonzalez Tubio Perez and Gustavo Pessin, Instituto Tecnológico Vale, Brazil; and Thomás Vargas Barsante e Pinto, Vale, Brazil
- 28. (A82) Auditabilidad desde el origen: integración de datos para contabilidad metalúrgica**  
Brayan Churata, Joe Vilchez y Jhon Muñoz, Datamine, Perú
- 29. (A83) Startup tracking and control loop tuning applied to industrial equipment**  
Barbara Bulgarelli A Aguiar, Daniel Miranda, Eric Baeta and Graciana Oliveira, Vale, Brazil
- 30. (A88) Automatic rate control of a bucket wheel reclaimer to improve productivity and stability**  
Alexandre Fonseca, Robson Duarte and Kaike Albuquerque, Vale, Brazil
- 31. (A94) Comparative analysis of control strategies for feed rate loops in mining circuits with high dead time**  
Daniel Miranda, Gercilio Zuqui and Bárbara Bulgarelli, Vale, Brazil
- 32. (A99) Sistema de control MPC para alimentación mixta de mineral fresco y ripios en planta de aglomerado**  
David Arancibia y Marco Encina, Honeywell, Chile; Camilo Labrín y Cristian Orellana, Minera Spence, Chile
- 33. (A101) Evaluation of feed rate control adjustments for reducing average truck dumping time**  
Camila Ribeiro Carneiro, Mateus Filipe Silva, Cristiano Citi Ottoni and Jackson Sousa Silva, Vale, Brazil; and Vinicius Antonio Ferreira, IHM Stefanini, Brazil

## Remote operation and maintenance centers

(01 abstract)

1. **(A59) Plataforma inteligente para monitoreo y predicción de procesos industriales en minería**  
Felipe Castillo, I&T Solutions, Chile

## Legal, privacy, and cybersecurity challenges in technological development

(03 abstracts)

1. **(A01) Minería digital segura: ciberseguridad IT/OT, riesgo operacional y cumplimiento normativo**  
Martín Fonzo, Communi, Argentina
2. **(A45) Cybersecurity, privacy, and regulatory compliance as enablers of secure digital mining**  
Yaser Alsakaji and Douglas Gomes, Intelltech Intelligent Technologies, Brazil
3. **(A110) Estrategia para enfrentar la suplantación de identidad en la era de la inteligencia artificial (Deepfake)**  
Danilo Pomalaza y Melissa Nole, Compañía Minera Antamina, Perú

## Technological innovation for operational excellence, sustainability, and social wellbeing

(16 abstracts)

1. **(A09) Aplicación de herramientas digitales en la ingeniería de registro: experiencias en la gestión de depósitos de relaves**  
Consuelo Rodríguez, Abraham Figueroa, German Toledo y Wolfgang Wachtendorff, Arcadis, Chile
2. **(A10) Cortex AI: resource autonomy and the human factor at the frontier of earth and space**  
Melissa Amado and Jorge Lozano, Bee3 Mining Tech, Chile
3. **(A26) Predicting blast-induced vibration risks using machine learning for proactive mine planning**  
Nicolás Rebolledo, Cristián Olmos, Hugo Lozano and Pablo Durán, Universidad Adolfo Ibáñez, Chile
4. **(A31) Context lifecycle framework: bridging project-to-operation handover in Latam mining**  
Vitor Bueckmann, Hexagon, Brazil
5. **(A38) Disaster detection and early warning technologies: a solution for high availability in geotechnical monitoring**  
Leonardo Queiroz, Bárbara Houry and Camila Nunes de Souza, Vale, Brazil
6. **(A53) Productivity increase through the optimization of exclusion zones using new digital technologies**  
Igor Oliveira and Jair Alarcon, Orica, Brazil; Carlos Campos and João Soares, Vale, Brazil
7. **(A56) Digital transformation of territorial analysis in mining projects using artificial intelligence**  
Gisele Ramos and Talita Bracher, Vale, Brazil; and Isabella Alves, The Bakery, Innovation Consultant, Brazil
8. **(A68) Estrategia de detección y gestión de pérdida de carga en correas para evitar atollos**  
Gabriel Droguett y Nicolás Fuenzalida, Honeywell, Chile

9. **(A72) Operación basada en condición, brechas técnicas y organizacionales**  
Nelson Escobar y Rodrigo Vergara, SIMPRO, Chile
10. **(A76) Sistema de monitoreo de cumplimiento en señales de pare en minería a cielo abierto**  
Hugo Goncalves, A. Franca, Ruda Martins y S. Junior, Hexagon, Brasil; A. Gutarra y A. Olarte, Hexagon, Peru
11. **(A77) Diagnóstico del greide en vías de acarreo mediante datos GPS de sistemas de seguridad vehicular**  
Hugo Goncalves, A. Franca, Ruda Martins y S. Junior, Hexagon, Brasil; A. Gutarra y A. Olarte, Hexagon, Peru
12. **(A79) Cálculo de metas operacionales basado en percentiles a partir de datos de sistemas anticolidión**  
Jecar Arroyo, Hexagon, Chile; Hugo Gonçalves, A. Franca y Ruda Martins, Hexagon, Brasil
13. **(A90) Piloto digital para la evaluación temprana de camiones híbridos en minería a cielo abierto**  
Edwin Pamo y Juan Yarmuch, Universidad de Chile
14. **(A95) Sistema de alerta multimodal con monitoreo de gases y voceo IP para minería**  
Terry Fernandez y Edwin Fernandez, New Project, Perú
15. **(A118) Sistema integrado de monitoreo de vibraciones para la optimización de la convivencia operacional entre minas OP y UG**  
Edgar Vielma y Fernando García, Orica, Chile; Claudio Becerra y Claudio Montenegro, Minera Candelaria Lundin Mining, Chile
16. **(A123) Cambio de tricono robotizado**  
Patricio Fuenzalida y Mario Poblete, Codelco, Chile

## Electrification in mining: electrical and energy infrastructure, integration of electric fleets, electrification of heavy machinery

(05 abstracts)

1. **(A04) Electrical generator selection for islanded power stations**  
Rene Rossi, R. Rossi & Associates, Australia
2. **(A05) Hybridization of diesel electric dump trucks**  
Rafael Tutini, ABB, Chile
3. **(A51) Technical and economic evaluation of electric trucks fleet for the Andean countries**  
Gerson Bastos and Pablo Monsalve, Ausenco, Chile
4. **(A85) Dimensionamiento de infraestructura de carga para equipos a batería en minería subterránea**  
Agustín Vilches, Kevin Espinoza, Fernando Urzúa, Iván Pérez, Francisco Jaramillo, Ángela Flores, Luis Orellana, Marcos Orchard y Javier Ruiz-del-Solar, Universidad de Chile; Gonzalo Monsalve y Gonzalo Ramírez, Codelco, Chile
5. **(A112) Transformadores digitales en minería: de la monitorización a la gestión de flota basada en riesgo**  
Marcelo Ulloa, Rhona, Chile y Estevan Bravo, Maschinenfabrik Reinhausen, Brasil

## ABSTRACTS DISTRIBUTION

### MINING COMPANIES

(57 abstracts)

Anglo American, Brazil (1)  
 Anglo American, Chile (1)  
 Asarco, USA (1)  
 Codelco, Chile (6)  
 Compañía Minera Antamina, Peru (1)  
 Lundin Mining, Chile (1)  
 Minera Spence, Chile (1)  
 NovaAndino, Chile (1)  
 Samarco Mineração, Brazil (4)  
 Southern Peru Copper Corporation, Peru (1)  
 SQM, Chile (1)  
 Stawell Gold Mines, Australia (1)  
 Teck, Chile (1)  
 Vale, Brazil (36)

### ENGINEERING AND CONSULTING COMPANIES

(35 abstracts)

Accenture, Brazil  
 Angelis, Chile (1)  
 Arcadis, Chile (1)  
 Ausenco, Brazil (1)  
 Ausenco, Chile (2)  
 Automation, Chile (1)  
 Bee3 Mining Tech, Chile (1)  
 Communi Technologies, Argentina (1)  
 Dassault Systèmes, Brazil  
 Dassault Systèmes, Chile (1)  
 Dassault Systèmes, Colombia (1)  
 De Re Metallica Ingeniería, Chile  
 Deloitte, Brazil  
 EH Consulting Lat, Peru (1)  
 EY, Brazil  
 Geomin Tecnologia, Brazil (1)  
 Hexagon, Brazil (3)  
 Hexagon, Chile (2)  
 Hexagon, Peru (3)

I&T Solutions, Chile (1)  
Ingeniería Wiseconn (1)  
Innovaengine, Chile  
Inprint, Chile (1)  
Intelltech Intelligent Technologies, Brazil (3)  
Intelltech Intelligent Technologies, Chile  
Intico Mining, Chile (1)  
Mogai, Brazil  
New Project Perú, Peru (2)  
Polpo, Chile (1)  
Progen, Brazil  
R. Rossi & Associates, Australia (1)  
Ribbeon, USA (2)  
SAX Sistemas Analíticos, Chile  
SGS Canada, Canada (1)  
Steryon, Spain  
TAGNA Tecnologia, Brazil  
Tata Consultancy Services, Brazil  
The Bakery, Innovation Consultant  
WSP, Chile (1)

## SUPPLIER COMPANIES

(20 abstracts)

ABB, Brazil  
ABB, Chile (1)  
Andritz, Chile (2)  
Antara Solutions, Chile (1)  
Datamine Perú S.A, Peru (1)  
Datarock-IMDEX, Australia  
Emerson, Brazil  
Emerson, Costa Rica (1)  
Emerson, Mexico (1)  
Emerson, USA (1)  
Endress+Hauser, Chile (1)  
Geocom, Chile (1)  
Honeywell, Chile (1)  
IHM Stefanini, Brazil  
IHM, Brazil  
Maschinenfabrik Reinhausen, Brazil  
Molycop, Australia  
Molycop, Chile (1)  
Orica Brazil  
Orica, Chile

PSINet, Chile (1)  
Rhona, Chile (1)  
Schneider Electric, Chile (1)  
Siemens, Brazil (1)  
SIMPRO, Chile (1)  
Solaer, Chile  
Strayos, India (1)  
Terrestra, Chile (1)  
TIMining, Chile  
Woodgrove Technologies, Canada (1)

## UNIVERSITIES AND RESEARCH

(10 abstracts)

Federal Institute of Education, Science and Technology of Rio Grande do Sul, Brazil  
Federal University of Lavras, Brazil  
Instituto Euvaldo Lodi, Brazil  
Instituto Federal de Educação, Ciência e Tecnologia do Espírito Santo, Brazil  
Instituto Tecnológico Vale, Brazil (2)  
Pontifícia Universidade Católica do Rio de Janeiro, Brazil (1)  
Tecnalia, Spain (1)  
Universidad Adolfo Ibáñez, Chile (1)  
Universidad Central del Ecuador, Ecuador (1)  
Universidad de Chile (1)  
Universidad Nacional de Colombia (1)  
Universidade Federal de Ouro Preto, Brazil (1)  
University of Arizona, USA (1)