BRASS Engineering International
Leading Edge Technology for Pipeline Systems
BRASS is a group of service companies specializing in the design and development of long-distance pipelines for the conveyance of mineral products (ore, concentrate, tailings). BRASS’ experts are well-experienced in the pipeline transport of water and hydrocarbons (coal, oil and gas) and petrochemical (e.g., diesel) products. It has highly qualified personnel with excellent experience in all aspects of pipeline engineering.

In addition to its main headquarters in San Ramon, California, BRASS also has offices in:

- Santiago, Chile
- Brazil
- Beijing, China
- Philippines

The scope of our services encompasses:

- Slurry Testing and Evaluation
- Conceptual and Feasibility Studies
- Basic and Detailed Engineering Including:
  - Transient Analyses
  - Risk Analysis
  - Flexibility (Pipe Stress) Analysis
  - Hydraulic Steady State and Dynamic Computer Simulation
- Expert Controls and Leak Detection System
- Procurement Support
- Construction Support
- Pre-Commissioning, Commissioning and Startup
- Operations Support
- Personnel Training

BRASS continues to expand its more than 150-strong manpower, specializing in the design of pipeline transport systems worldwide. We have developed our engineering design capability to the highest levels of technological standards, backed by years of experience of our principal members. We are capable of handling EPCM-type projects, ensuring best options for materials procurement and timely accomplishments. All BRASS companies adhere to a stringent set of procedures set in the ISO 9001 norm, sharing expertise and highly skilled manpower resources in our major projects worldwide.
Welcome. As you browse through this brochure I believe you will see that BRASS is unrelenting in its commitment to excellence in all that we do for our clients, employees, the environment, and the communities where we work and reside. BRASS has gained a reputation for quality, timely work, and client satisfaction by emphasizing:

**Quality.** Since its inception, BRASS has innovated, developed, led, and maintained a **leading edge technology** for design of slurry pipeline technology. Further, our design and implementation of these systems are accomplished through BRASS’ personnel. BRASS personnel have **extensive experience** in the actual operation of many pipeline systems and applying that knowledge to managing projects. Throughout the course of project execution from concept through commercial operation, BRASS strives to maintain **continual and clear communication** with client and all other vested parties. We have established and proven procedures in performing our project tasks in order to ensure **efficient** production with an emphasis on the highest levels of QA/QC.

**Project Controls.** While pursuing cost-effective solutions to design and construction, BRASS takes pride in meeting or exceeding **completion schedules** and maintaining our efforts to keep within project **budgets**. Our largest office, BRASS Chile has maintained ISO-9001 certification. All other BRASS entities follow procedures that are uniform and consistent with BRASS Chile.

**Safety.** Whether in the design office or on field assignments, BRASS emphasizes safety and charges each individual with the serious responsibility to follow our safety procedures or the client’s, whichever is the most stringent. “**Think safety first**” is a motto that always applies to the benefit of workers and organizations alike.

**Environment.** BRASS endeavors to be environmentally responsible in all aspects of design and construction supervision. BRASS maintains a “Green” office and monitors the carbon footprint of each work process. BRASS works on continuously improving procedures to minimize environmental impact both during design as well as during construction.

**Growth.** BRASS has enjoyed substantial growth since the time I started on my own. The main reason is because of the **outstanding personnel** who have joined BRASS and their desire to pursue excellence in their profession. With the **client in mind** we have made it our policy to control growth commensurate with maintaining a high level of knowledge exchange and development.

Should you have a venture where BRASS can assist, I trust you will find value in working with BRASS toward a successful and satisfying outcome. Please give us a call or visit our website at www.BRASSEngineering.com.

Sincerely yours,

Brad Ricks
President
VISION

Our vision is to be the preferred and leading international full-service engineering firm for long-distance pipelines. BRASS is committed to Honesty, Excellence, and Dependability. We are a company that excels in observing and respecting all technical, environmental and cultural standards in all aspects of operations.

MISSION

Our mission is to provide top quality engineering services to all business and industrial sectors requiring long-distance pipeline transport. It is our constant commitment to contribute to our clients’ profitability and stability by providing state-of-the-art engineering and design for pipelines that are reliable, cost-efficient, and environmentally secure.

To find out how BRASS can be part of your team, give us a call or visit us online at www.brassengineering.com.
QUALITY POLICIES

BRASS is committed to delivering engineering services at its highest quality in compliance with our clients’ requirements. We ensure that all our engineering and design services satisfactorily comply and strictly adhere to applicable local and International standards. In addition, we have established a Quality Assurance Program that complies with the requirements of ISO-9001, 14001, and 18001. The ISO certification awarded to the BRASS Chile office is updated and validated every three (3) years and is annually audited by third party firms. All BRASS companies adhere to procedures set in the ISO.
BRASS USA (Main Headquarters)
BRASS Engineering International (BEI)
Main Headquarters
• Started as consulting company in 1998
• Became a full service engineering company in 2000
• Multi-discipline engineering expertise
• Gives corporate directives, guidelines and technical support to the BRASS group of companies.

BRASS Chile
BRASS Chile, Sociedad Anónima (BCSA)
Established in Santiago, Chile in 2001
• Responsible for whole of Latin America
• Multi-discipline engineering expertise
• ISO-9001 compliant starting 2006, revalidated in 2009

BRASS Beijing
BRASS (Beijing) Pipeline Technologies, Ltd.
Established in Beijing, China in 2004
• Currently responsible for SE Asian region
• Multi-discipline engineering expertise
• Can provide full service engineering for long distance pipeline

BRASS Brasil
Brass do Brasil Projetos e Consultoria Técnica Ltda.
• Located in Bello Horizonte, the center of the mining industry in Brasil
• Licensed in July 2008
• In charge of project generation and implementation in Brasil for BCSA.
• Has won projects with SAMARCO and VALE for long-distance iron concentrate and bauxite pipelines
BRASS has developed in-house simulation packages of dynamic slurry hydraulic behavior that have been developed through a solid theoretical background in pipeline design, reinforced with extensive field experience. This enables us to offer the following integrated pipeline design services:

**Engineering**
- Prefeasibility & feasibility studies
- Conceptual studies
- Basic engineering
- Detailed engineering
- Transient modeling and analysis
- Systems operation modeling
- Piping flexibility analysis
- Risk Analysis

**Field Support & Inspection**
- Construction management
- Commissioning & start-up
- Operator training
- Pipeline integrity audit
- Emergency response planning & risk assessment
- Pipeline operations support
- Project Scheduling
- Environmental Studies

**Laboratory**
- Particle Size Distribution
- Specific Gravity
- Corrosion Testing
- Settling Test
- Angle of Slide
- Angle of Repose
- Penetration Testing
- Slurry rheology

**Control & Automation**
- Supervisory Control and Data Acquisition (SCADA) System
- Pipeline expert control systems
- Pipeline computer simulation
- Leak detection systems for slurry pipeline
- On-line hydraulic simulation applications

**Project Administration**
- Project management
- Cost control
- Quality control

**Project control and scheduling**
- Procurement services
- Technical inspection services

**OIL, GAS and PETROCHEMICALS**
While BRASS has carved a niche in the industry as a leading and preferred Slurry Pipeline System Specialist, our experts have wide ranging experience in the design, analysis, evaluation and automation of hydrocarbon and petrochemical pipelines. They have been involved in some of the biggest oil, gas and diesel pipeline projects worldwide. We employ the latest software and make use of extensive database in the design of the respective pipelines. We conduct:

- Crude oil, natural gas, and CO₂ pipeline steady and transient hydraulics
- Pipeline SCADA and leak detection system monitoring and control analysis
- Pipeline Maximum Allowable Operating Pressure (MAOP) and surge protection analysis
- Multiphase pipeline hydraulics, slug size prediction and slug catcher sizing
- System process simulation and design of gas and LNG facilities, compressor stations, crude oil and liquid pump stations, gas and liquid storage facilities, pipeline heating and cooling facilities
- Piping and equipment sizing, specification, and procurement document preparation
Supervisory Control and Data Acquisition (SCADA) and Distributed Controls Systems (DCS)

BRASS can provide a complete package of controls and communications for pipeline applications, and other systems too. BRASS can handle all or any part of control system packages:

- Design
- Engineering
- Hardware, Software supply
- Integration, and Programming
- Commissioning for these systems

**Note:** Long distance control and monitoring for remotely located stations is standard for pipelines.

Included with BRASS capability is leak detection where pipeline leaks can be detected and located in terms of minutes. Also, expert controls can be utilized for “look ahead” (feed forward) control action in anticipation of precarious situations so that proactive controls avoid in advance threats to the system’s integrity.

As part of long distance impressed current cathodic protection, remote controls and station monitoring, BRASS can engineer and supply remote power units such as solar, thermoelectric, hydrocarbon based or other according to UL or CE (European Conformity) standards.

BRASS has a range of software developed in-house which is used in the design of slurry pipeline and as a simulation tool for start-up and testing. Software can:

- Predict hydraulic flow behavior in closed pipelines as well as in open-channels based on physical properties of the slurry
- Perform pipeline simulation used for transient analysis, design, operating procedure development
- Develop design of chokes for energy dissipation
- Deliver simulation for dynamic behavior of liquid/slurry systems and basis for BRASS’ leak/plug detection systems and expert control systems
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