



Camminos

Newsletter of the Pan American Institute of Highways

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Third Quarter 1999

NATIONAL HIGHWAY INSTITUTE — Your Training Partner for Success

Since 1971, the National Highway Institute (NHI), the training department of the Federal Highway Administration (FHWA), has offered courses to transportation professionals in the United States and throughout the world. In 1998, more than 15,000 professionals participated in nearly 550 classes on topics ranging from engineering to time management. Through close cooperation with the NHI, there has been a special emphasis on collaboration with the Pan American Institute of Highways (PIH) to deliver courses in Spanish and Portuguese and to explore partnerships with other entities that share the common technology transfer mission in Latin American countries.

The most innovative practices in highway technology

For FHWA, training is the key to advancing the latest technology and best practices in highways applied to the transportation system. This has been possible through close partnerships with university research centers, private companies, and associations. According to Jorge Pagan, FHWA hydraulics engineer and NHI instructor in Washington, DC, "We respond to our customers' needs because we stay abreast of up-to-date technology and research."

The NHI supported PIH headquarters training activities and delivered more than 100 courses in 14 different fields. These include diverse topics such as Structures and Hydraulics; Materials, Pavements, and Base Design; Geotechnical Engineering; Design and Traffic Operations; Construction and Maintenance; Environment; Planning; Urban Planning; Highway Safety; and Intelligent Transportation Systems (ITS).

ITS courses are the most recent addition to the NHI curriculum, and they are already in high demand among NHI customers. These courses cover highway, transit, and multimodal topics. Some of the new courses have been taught in Latin America.

The National Highway Institute is getting better to better serve you

NHI has emphasized not only the development of the subject matter of the courses, but also the delivery methods. For this, experts in training and education have joined NHI staff, working closely with course designers and instructors to put the courses in a more interactive format. All 300 NHI instructors will go through a certification process to ensure consistent instructional quality and to encourage the use of "learner-centered" training methods, which are particularly suited to adult learners. This includes the instructor's ability to create an interactive environment in which participants share experiences, discuss issues related to their jobs, and apply the knowledge obtained from the course.

"We get many positive comments on the training because it applies directly to what our employees do," observed William Hulbert, a hydraulics engineer from the South Carolina's

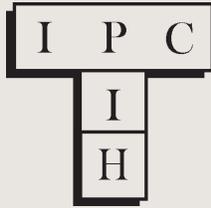
Department of Transportation (DOT). A similar comment was made by Arno Grey, manager of technical training with the Illinois DOT, "The employees enjoy the theory combined with the practical experience. And what they learn in the classroom can be applied on the job the next day."

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Caminos is distributed to PIH centers, to FHWA's Washington Headquarters and field offices, the transportation community in the Americas, and agencies having direct involvement with highway technology transfer.

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U.S. Department of Transportation
Federal Highway Administration

Message from the Acting Executive Director of the PIH

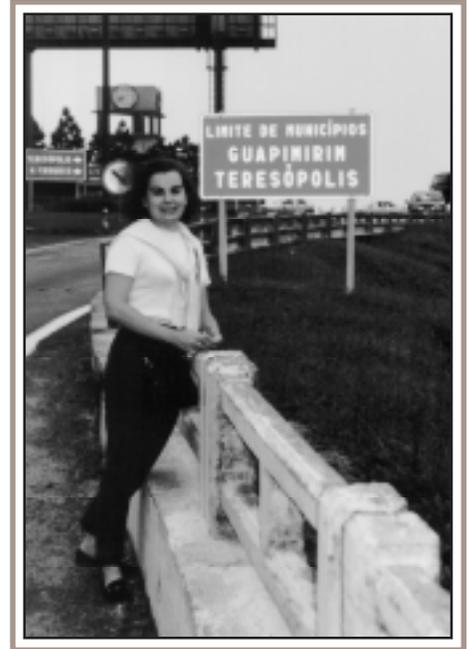
Dear PIH members:

In my capacity as Acting Executive Director in charge of the activities of the PIH, I am delighted to send you this message. First, I send my warmest regards to all of you; second, it is my pleasure to inform you of our immediate plans to update the services that the PIH Headquarters provides to the highway community in the Americas and Spain. These activities are in direct response to the recommendations made at the PIH Executive Committee meeting, which took place in Miami, May 1998.

By the time that you read this, the Institute's web page will be in service. This tool will be essential if our organization is to modernize its operations regarding information systems, and it forms part of a broader concept that is the globalization in the transfer of technology matters through this excellent mechanism. This service was long overdue, and we are very pleased and grateful for all the hard work at Headquarters to achieve this important objective.

In addition to the many informational services that it already includes, the PIH web site (www.pih-ipc.org) will allow you direct access to the web pages of the network's centers, as well as those events that have their own web sites. Additionally, it will facilitate your access to the different organizations and entities tied to highways and transportation. This will have a multiplier effect in information because there are also links with other sources of information with similar objectives.

The PIH leadership has also recommended reestablishing the Professional Loaned Staff Program, in which 25 professionals from 11



countries have participated to date. We will soon announce the specific available projects, and we will then open the competition to select from professionals who are directly involved in highway matters. Once they complete their assignments, they will contribute to the dissemination of traditional and innovative technologies in their respective countries and organizations.

The training program, which between 1993 to 1997 conducted 108 courses on 14 different topics, will be revitalized and coordinated directly by the PIH Headquarters, in collaboration with other FHWA offices.

We invite you to use the services provided by our web page, and we welcome any information that you would like to include in the web page. Our objective is to transfer technology. With your help, we can achieve it.

TERE FRANCESCHI
Acting PIH Executive Director

To All My Friends in the PIH Community . . .

After more than 30 years of service with the Federal Highway Administration (FHWA), I have decided to end my public service career and begin a second career working in the private sector. I say in the most emphatic terms that I am very proud to have served as a member of the FHWA team, and I appreciate the trust and freedom that FHWA management has given me, especially over these past 12 years of work with the highway community of the Americas. Together, we assembled the PIH network. My work with the FHWA has been a blessing, both in the work I have done and those with whom I have had the pleasure and honor of working.

For the past 12 years, I have been FHWA's representative to the Americas, and I have tried my best to always convey my high regard for FHWA and for the FHWA family. During those years, I have also worked to represent the highway community of the Americas to the FHWA and to our many partners in the United States. To those in the FHWA and in the U.S., I say thanks for all of your support that made it possible for me and my colleagues at the PIH Headquarters to transfer your technology, research results, processes, dreams, and yes, some of your failures. We may never know how helpful we have been in improving service, reducing costs, and enhancing safety — just to mention a few of the results that I have seen in the Americas.

To my colleagues in the Americas, thanks for your trust, for showing me your needs, for sharing with me your activities, your research, your problems, and your failures. Visiting with your highway departments, universities, associations, and the



private sector has always been a joy and a privilege that few people ever have. I always felt honored to visit and share with you.

What will the future hold for the PIH now that Greg Speier has retired? There will be change, not because there is a new executive director, but more because we are part of a world that is changing faster every day. The PIH, as an international entity, must change to keep pace with the rest of the world. This PIH that we have created together is serving the needs of the highway community of the Americas. With your continued support and cooperative efforts, it can do that job even better in the future.

Finally, allow me to publicly thank a few of the very many special people who have worked with me over the last few years. First, Enrique Ordoñez, who has been with the PIH since it was first formulated as a concept during the Pan American Highway

Congress of Mexico, 1986. Without Enrique's organizational skills we would never have progressed. Next, I thank Director General King Gee and also Bob Ford, my supervisors in the FHWA. Their commitment to make the PIH network a model for other regions of the world made my work so much easier. Finally, I recognize the efforts of my friend, and the President of the PIH Executive Committee, Julio Caballero. His advice and mentoring have been essential to our success.

In my final weeks of work with the PIH, many of you sent me letters, e-mail messages, and faxes expressing your thoughts. I thank Daphne Speaks for

taking the time to place all of these in a special book, a book that I will treasure and that will help me remember.

My final prayer is that we can all find ways to better work together. That is the central reason for having a PIH network. I know that we will be able to do a better job of building, maintaining, and operating our respective highway and transportation systems — if we can see how our neighbors find solutions, extend our hands to offer our solutions, and find ways to make it possible for others to learn from what we *and* our neighbors have accomplished together. It is a labor of love and dedication, two characteristics that I have seen in so many of you.

I look forward to my continued involvement in the PIH network as one more member in one of the truly unique highway organizations of the world.

GREG SPEIER

National Highway Institute (Continued from p.1)

Partnerships in Latin America

NHI has delivered its courses to international audiences, particularly in Latin America. To support these important partnerships with Latin America transportation organizations, NHI acts as a Technology Transfer Center (T²) of the Pan American Institute of Highways network. NHI participates in the PIH Loaned Staff Program by sponsoring professionals from Latin America who have transportation training expertise.

NHI also has a training program specifically for Latin America. The main purpose of the program is to offer training courses in the region that emphasize course quality, meet local needs at affordable prices, and increase local capacity to affect transportation issues.

Two professionals currently work in the Latin American Program — a senior international program specialist

and a loaned staff from Brazil. Their role is to identify customers' needs and develop new ways to make training available to those countries.

Latin American audiences have three alternatives for training delivery, including:

1. Courses in the United States open to Latin American audiences:
 - NHI Courses held in U.S.
 - NHI International Course on Pavement Training.
2. Courses in Latin America taught by NHI instructors, mostly in English.
3. Courses in Latin America taught by local instructors (NHI-licensed courses). Licensing authorizes a public or private organization to translate and deliver NHI courses

in Latin American countries, retaining the NHI name for the course.

Free Courses in the United States

For each course delivered in the United States, NHI reserves two openings for international participants, free of tuition charges. Organizations interested in sending professionals to the United States pay only for the



The Learning Center of the National Highway Institute has 12 spacious training rooms equipped with modern technology to facilitate new instructional methods such as video conferencing and distance learning.

Visit our Web site...

www.pih-ipc.org

The Web page provides an interactive communications channel for use by all members of the Pan American Institute of Highways (PIH) network, such as: • Highway and Transportation organizations • Professionals in the highway field from Latin America and the Caribbean • Organizations interested in the advancement of highway and transportation technology • PIH Members and Sponsors.

The Web page offers to its customers information on:

• Transfer of technology and dissemination of research results • Training among professionals, technicians, and other personnel in the highway sector • Forum for exchange of information and

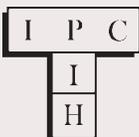
experience • Periodic publications • Schedule of events • Sponsorship and membership activities • Special programs such as PROVIAL-EXPOVIAL events and the Loaned Staff Program • Access to the World Interchange Network (WIN) • Establishment and maintenance of links with the network of PIH centers • PIH sponsors and other relevant web sites from organizations related to highway and transportation activities.

The Web page will be updated the first day of the month. If you would like to have information published on the Web page, it must be made available to the PIH headquarters by the 15th of the previous month. Please submit information for publication via the e-mail listed below.

pih-ipc@fhwa.dot.gov

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**Pan American
Institute of Highways**



participant's travel and per diem costs. To take advantage of this offer, participants should have a good knowledge of English.

Regular Courses in the United States

Latin American participants can also attend NHI courses in the United States by paying full tuition costs. For example, professionals from Venezuela, Costa Rica, Honduras, Guatemala, Nicaragua, and Mexico participated in an International Pavement Training Course in Reno, Nevada.

Instructors Teach NHI Courses in Latin American Countries

Last year, 120 professionals from Chile, Bolivia, and Peru attended NHI courses delivered in their countries that were sponsored by national transport associations as part of their technology transfer programs.

First License to Deliver NHI Courses in Latin America

With this license, public or private organization in Latin America are authorized to translate and teach NHI courses. The NHI *Bridge Maintenance* course will be the first license awarded. A Brazilian company is working with the NHI to obtain the license and teach the course in Brazil.

To learn more about NHI's international activities, please contact Gisa Bougleux (703) 235-0551, or Liana Montero at (703) 235-0550, or e-mail gisa.bougleux@fhwa.dot.gov or liana.montero@fhwa.dot.gov. Website: www.nhi.fhwa.dot.gov

PROVIAL Seminar — Nuevo Leon, Mexico

PROVIAL Nuevo Leon 1999 Focuses on System Preservation and Institutional needs

Under the auspices of the Border Technology Exchange Program, the PIH and a team representing Mexico's Secretaria de Comunicaciones y Transporte (SCT), the six Mexican border states, and the southwestern U.S. State Highway Agencies, completed the second in a series of

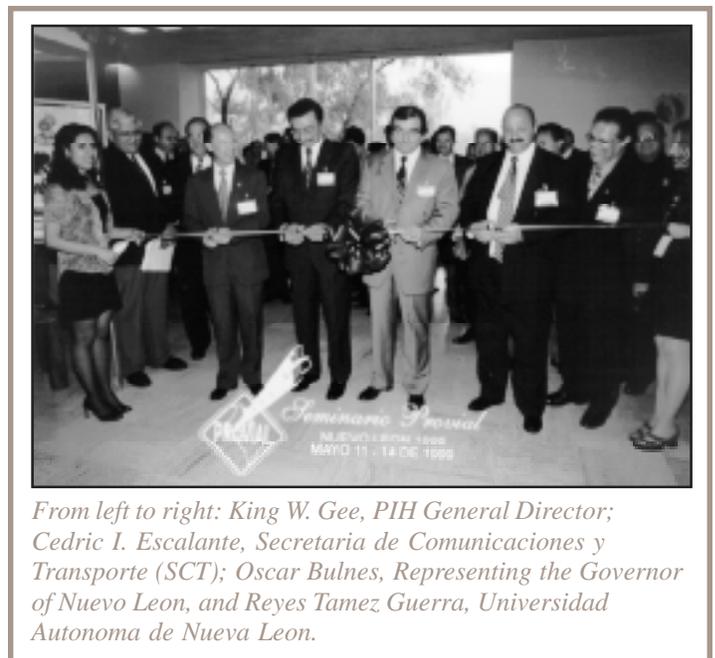
border PROVIAL Seminars. As the host State, Nuevo Leon provided the facilities of the Autonomous University of Nuevo Leon in Monterrey, the venue for this Seminar held May 11 to 15. More than 180 participants attended lectures and presentations on Road Maintenance and Institutional Reform by local and international

speakers. The program was strongly supported by each of the members of the Border Technology Exchange Program, which includes the 10 U.S./ Mexico Border States and both federal governments. The program included representatives of government agencies, academia, and industry from Mexico and the United States.

The 1999 PROVIAL Nuevo Leon built on the foundation of the first border PROVIAL held in May 1998, in Chihuahua City, Chihuahua. Presentations and workshops produced a list of program needs and

recommended actions. The results and recommendations from Nuevo Leon reinforce those developed by the practitioners in the workshops a year earlier. Key actions and recommendations include:

1. Economics and Maintenance Funding. A top priority for both the Federal and local levels is the need for a trust fund or other dedicated funding source.



From left to right: King W. Gee, PIH General Director; Cedric I. Escalante, Secretaria de Comunicaciones y Transporte (SCT); Oscar Bulnes, Representing the Governor of Nuevo Leon, and Reyes Tamez Guerra, Universidad Autonoma de Nueva Leon.

2. Maintenance Planning. Establish a maintenance program that is not affected by political changes.
3. Training. Provide training to personnel in charge of highway maintenance for both the public and private sector.
4. Corruption. Establish means to improve salaries and implement programs focused on raising ethics of highway personnel at all levels of government.

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Anti-Icing Technology, Field Evaluation Report

Technical Summary

Introduction

Highway anti-icing is the practice of controlling snow and ice to prevent the formation or development of a bond between the pavement and snow and ice by timely applications of a chemical freezing-point depressant. Its operations consist of chemical applications and coordinated plowing. The prefix *anti-* signifies the preventive nature of anti-icing and distinguishes it from deicing, which is the traditional practice of mechanically or chemically removing compacted snow or ice that has already bonded to pavement.

Anti-icing practices have been used for many years. The term has evolved to mean a modern and efficient snow and ice control practice that systematically uses an array of new technologies, including road weather information systems, site-specific weather and pavement condition forecasts, portable pavement temperature sensors, and sophisticated spreader equipment, as well as conventional and traditional technologies and practices.

Anti-icing can provide two major benefits — efficient use of labor and materials, and increased traffic safety. The project reported here is Federal Highway Administration (FHWA) Test and Evaluation Project N° 28, Anti-Icing Technology (T&E 28), which is part of the FHWA Strategic Highway Research Program (SHRP) implementation.

Purpose and Scope

The purpose of the study was to implement and evaluate existing technologies tested and reviewed

under SHRP Project H-208, Development of Anti-Icing Technology, T&E 28, including anti-icing testing over the course of two winters and analysis of the resulting data. The testing comprised field operations and experiments by highway agency personnel; the data analysis consisted of graphical and statistical analyses. The report describes the field evaluation experimental program, experimental



details of the sites, the data analysis, results and interpretations of the experiments, a cost analysis, recommendations for anti-icing practices, and conclusions and recommendations for further work. The report is not a guide to anti-icing practices, rather it is a companion to the *Manual of Practice for an Effective Anti-Icing Program: A Guide for Highway Winter Maintenance Personnel* (FHWA-RD-95-202), which provides such guidance.

Findings and Conclusions

Fifteen States participated in the project, each implementing anti-icing operations at a test site or sites,

according to each State's design and preferences. In combination, these operations provided a wide range of practices for evaluation. Friction measurements, pavement condition observations, and judgments of agency personnel determined their effectiveness. The report documents tens of thousands of these measurements. They originate from 119 storm experiments, each consisting of anti-icing operations on a "test section," conventional operations on a "control section," and documentation of the operations and the road and weather conditions, and collection of the effectiveness data. Analyses of the data sets from the storms were individually and in blocks to represent a given season and site. The data were predominantly from snowstorms.

Anti-icing operations, without the application of abrasives, can lead to a considerably higher degree of operational success throughout a storm, relative to conventional practice. Well-timed chemical applications can prevent or mitigate a reduction in friction, as well as support the anti-icing objective of preventing a strong bond from developing. In place, vigilant and systematic anti-icing operations can achieve overall seasonal success in preventing sustained packed snow conditions. Yet, when a dangerous snowpack does develop, prior anti-icing applications can lead to a weaker bond between the pavement and snow and an earlier breakup of the pack.

Analysis of the combined effects of pavement temperature, precipitation rate, and traffic rate on friction

showed that: (1) reduced friction with decreasing pavement temperature, increased precipitation rate, and decreased traffic rate should generally be expected during a storm, even when successful anti-icing operations are conducted; and (2) of the three variables, traffic rate appears to have the weakest effect on friction, while pavement temperature has the strongest effect. The precipitation rate occupies the middle ground. Further analysis of friction with precipitation showed that, in the storms of this project, friction was considerably lower in heavier snow than in light snow, reflecting consistent deterioration of pavement conditions with increased snowfall intensity. Data histories from many of the individual storms support this finding, showing that packed snow conditions are most likely to occur soon after increased snowfall intensity. These data, taken together, suggest that snowfall intensity should be considered as important a variable as pavement temperature in the design of anti-icing operations, and that attention to snowfall intensity will result in the greatest improvements in anti-icing effectiveness, particularly during the storm.

One of the most important conclusions of this evaluation is the significance, for this purpose, of a *storm within a storm* approach to anti-icing operations, which focuses not only on chemical application before or near the beginning of the storm, but also on well-timed preventive applications during the storm. This applies primarily to light snow storms that contain short periods of moderate or heavy snow, and involves practices combining the basis strategy of anti-icing (preventing a bonded snowpack) with a complementary strategy of limiting reductions in friction caused by increasing rates of snowfall.

While the implementation of anti-icing practices should be thought of as a means to systematically maintain roads

during winter storms and using resources optimally to do so, it should not automatically be thought of as an improvement that will always reduce overall costs. Most importantly, anti-icing techniques provide the potential and capability for maintaining roads in the best condition possible during winter storms, consistent with the level of effort expended.

The secondary issue of savings depends on the current practice, for example, the level of service it supports, the materials it uses, whether it is more deicing than anti-icing, and what information sources it uses. In this project, the experiments generally compared different anti-icing operations. In general, this is because the conventional operations at the sites made good use of informational sources, were prompt, were not wasteful, and were performed in many respects according to an anti-icing strategy. As such, the study generally does not demonstrate cost savings as much as it reveals optimal techniques for improving road safety.

For more specific conclusions and recommendations, including implementation possibilities, the reader is encouraged to refer to the full report.

Reference: R.R. Blackburn, E.J. McGrane, C.C. Chappelow, D.W. Harwood, and E.J. Fleege, *Development of Anti-Icing Technology*. Report SHRP-H-385, National Research Council, Washington, DC, 1994.

Note: This technical summary announces the completion of an FHWA study that is fully documented in a separate report (FHWA-RD-97-132) of the same title. FHWA Contact: B.H. Chollar, HRN-20, (703) 285-2342.

PROVIAL Seminar

(Continued from p.5)

To address the recommendations developed by the Border States' PROVIALS, a Maintenance Action Team (MAT) will be created and include key representatives of the Mexican SCT, the six northern Mexican States, the FHWA, and several U.S. State Highways Agencies. This team would provide follow-up actions and activities to assist in implementing the recommended actions.

The venue for the PROVIAL Nuevo Leon 1999 was also the occasion for the ribbon-cutting ceremony for the newest border area Technology Transfer Center (T²). This center, located at the Autonomous University of Nuevo Leon, is the third of six centers proposed as part of a network of centers along the U.S.-Mexico border region. The border states T² Centers will provide technology exchange, training, and transportation information to the Mexican states and local governments, and will be similar to those established in the U.S. and internationally.

As a result of interest at this PROVIAL, several U.S. industry representatives indicated a willingness to assist by conducting a hands-on technical training workshop on Slurry, Micro Seal, and Chip Seal Mix design and application. The FHWA will work with the U.S. industries and the border states to bring this to fruition. Most discussions focused on developing and presenting this workshop, which is to be developed and presented by early fall.

Building on the success and interest of the two border PROVIAL Seminars in the region, the third U.S.-Mexico Border Region PROVIAL Seminar is being planned for March 28 to 31, 2000. The State of Baja California will host the seminar. For additional information on this upcoming meeting, contact Mr. Sergio Pallares, California Department of Transportation (CALTRANS), at (619) 688-3136.

Ecuadorian Society of Transportation Engineering

The Ecuadorian Society of Transportation Engineering (known by its Spanish acronym, SEIT) was created in 1983, as an agency of the College of Civil Engineers of Pichincha, Ecuador. SEIT provides a forum for analyzing, studying, and disseminating technological advances in highway engineering matters and provides an opportunity for executives of the government's transportation policies and infrastructure entities to collaborate on ways to improve the highway system in Ecuador.

SEIT joined the technology transfer network as a regular center in 1994, and in 1996, it received Certification as a PIH technology transfer center. Currently, the society has more than 150 members who represent various facets of the highway community, including construction companies, consultants, and civil engineers.



SEIT Mission and Activities

SEIT's mission is to collaborate with the highway community and with the organizations that execute the national highway plan. Currently, with the support of the Economic Commission for Latin America and the Caribbean (CEPAL), SEIT advises the Ministry of Public Works in preparing the Program for the Financial and Institutional Reform of Maintenance in the country and city of Quito.

SEIT also maintains a wide collaboration in the area of highway engineering with the Catholic University of Guayaquil and the Military Polytechnic School in the city of Quito. Recently, SEIT completed a technical symposium with the Ecuadorian Corporation for reconstructing the Litoral Region, which was affected by the El Niño phenomenon. Participants represented different sectors involved in this problem.

Additionally, SEIT is in the preliminary planning stages for the Second National PROVIAL, which will take place in the city of Guayaquil in 2000, and it continues to program courses and regular technology transfer activities.

SEIT Board of Directors

Members of the SEIT Board of Director are:

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Gilson Company sells quality instrumentation and know-how, particularly in the areas of SHRP and Superpave. When Gilson Company, Inc. looked for a way to expand its reach into Latin America, it saw the Pan American Institute of Highways' Corporate Sponsorship program as an ideal way to reach its direct market. Gilson joined the PIH network in 1996.

After participating in several PIH-sponsored activities, Gilson Company donated several testing instruments to the PIH mobile pavement-testing truck, which was showcased at numerous meetings. The contribution was one of several made by Corporate Sponsors that helped make the mobile PIH center a reality.

As the Gilson Company's Fawaz Hamaoui says, "Working with PIH has helped us reach many contacts and has given the firm a better idea of the nature of the different markets, needs, and opportunities throughout Latin America. At the same time, professional engineers in the region are very interested in the know-how and results that we offer. We look forward to participating in future trade shows and PROVIALS, which are so valuable. Everyone always learns something useful."



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Editor's note: Upcoming issues of Caminos will feature articles about corporate sponsors and their activities with PIH. To be featured, or to join PIH as a corporate sponsor, please contact or visit, www.pih-ipc.org