The 21st meeting of the International Group for Lean Construction (IGLC) was held in Fortaleza, a city about three hours by plane north of Sao Paulo. The meeting was a series of well-managed events, - a Gemba Day, an Industry Day, and the IGLC meeting - that opened new lines of thinking and provided opportunities to reconnect with colleagues and friends.

Looking back:

IGLC 21 was the 3rd meeting in Brazil. IGLC 6 met in Guaruja, a city on the beach near Sao Paulo, and IGLC 10 was held in Gramado, a city in the hills of Southern Brazil near Porto Alegre. IGLC 6 was a small affair with 23 papers. IGLC 10 in Gramado was much larger with over 50 papers. There we first met Pedro Pereira, a construction manager from Fortaleza. He had begun to develop an approach to managing construction projects based on his experience with the Toyota Production System. A gentle and direct man, he brought a humane and respectful approach to the design and management of production systems and became a close personal friend. Pedro’s presentation at an LCI Annual Meeting included his use of Kanban cards to pull materials to installation, Poka-Yoke tools to assure proper installation of plumbing materials, a system of lights to alert management to problems, pull systems to bring materials to work location when needed in the amounts required and on.

Pedro connected with the faculty at the Federal University of Ceara particularly Professors Luis Fernando Heineck and Barros Neto. Pedro and the faculty invited me to speak to a conference on improving project performance in 2003. There I reconnected with Professor Fritz Gehbauer from the Karlsruhe Institute of Technology. He may well be the person in the world who has had personal responsibility for the largest amount of work put in place. Now a close friend, colleague and driving force for Lean Construction around the world, he speaks Portuguese (and a number of other languages) and has written a book on improving productivity for Brazilian contractors.

All this is to say that IGLC is an organization where long deep personal connections open opportunities while welcoming new voices and perspectives. The web of relationships is at once extensive and personal. It includes practitioners, faculty and students. And this year that network extended more fully to Africa with participants from Botswana, Ghana, Nigeria, South Africa and Zimbabwe.

An Unexpected Highlight at IGLC:

Tobias Steinhaeusser’s presentation “Management cybernetics as a theoretical basis for lean thinking” opened a new line of thinking. Cybernetics is the study of systems and how they control themselves. Tobias’ thesis and paper explores the relationship between management cybernetics and Lean Construction. Cybernetics provides a new and rich theoretical background for understanding the application of lean thinking on projects. (By theoretical here, I mean an explanation for how things work. Gravity is a great theory because it explains why water runs down hill.) Cybernetics provides a powerful way to understand and explain why traditional project management is less successful than Lean Construction (LC). His work has opened a new
line of enquiry that can help us both as practitioners and academics better understand why LC works and how its principles and practices can be better tailored to the situation. Check out the Wikipedia link on the first word of this paragraph. You might also read Donella Meadows’ "A Childs Guide to Understanding Systems." I have suggested this before. While I urge you to read the entire essay, you can jump ahead to page 4 where she explains five ways systems fail. It isn’t hard to find a firm example in the construction industry of each listed failure mode. This article introduces system thinking using easy to understand examples. Her work was a major contribution to cybernetics.

The IGLC Week:

The meeting began on Monday with “Gemba Day” where we visited two building sites. C. Rolim Engenhariah is building an upscale 26-story condominium with two more or less customized units on each floor. Workers in each unit can signal management in advance of stopping work with a system much like Pedro used. The management of logistics within the building was difficult and superb: difficult because each unit required different materials and superb because of the careful inventory management system. Construction workers are not well paid in Brazil and have few benefits. C. Rolim Engenhariah provides free on-site dental work for their employees.

The second visit was to a residential tower under construction at a large golf course centered community development. How large? 1,534 Apartments in 99 blocks, 82 houses, golf courses and swimming pools in 10 years. For more details see the paper “Implementing Lean Construction effectively in a year on a construction project” by George Barbosa. Here again we could see many of the techniques pioneered by Pedro and extended to fit the situation. My favorite innovation was a system of dispatching forklifts by iPads to deliver needed materials to the right place at the right time. Materials were pulled directly to the location required by the immediate supervisors using iPads to order delivery directly without involving the office or hierarchy. This system is fully described and discussed in the IGLC paper “Heijunka system to level telescopic forklift activities using tablets in construction site” by George Barbosa.

Industry Day – More on this to be provided at a later time.

Tuesday was an “Industry Day”. It featured presentations by DPR on their application of Lean Construction at Palomar.

The IGLC Meeting

The IGLC meeting itself was a 2-¾ day marathon featuring 98 papers. The length of the papers was strictly limited to 10 pages each. Most authors used every line so the proceedings are about a 1000 pages long – about twice as long as Moby Dick. IGLC holds to the rule that all papers are presented and has avoided parallel sessions, accomplishing this required experimentation with various approaches to session management and mixed presentation styles. So organizing presentations and creating the opportunity for rich, full-on-contact conversations about the issues raised isn’t easy.
The agenda was broken into 11 sessions of different length devoted to Theory, Product Development and Design Management, Production Planning and Control, People and Implementation, Supply Chain Management and IPD and Safety, Quality and Environment. The organizers decided to break the sessions into logical topics, set short durations for leading papers and used poster presentations built around A3 reports for the remainder. Most sessions began with three or four presentations of about 10 minutes with brief answers to questions and group discussion. Poster sessions were organized for the remaining papers. We experimented and learned quickly. By my session on the last day, we had a balance of podium presentations and poster sessions. People selected those poster sessions that interested them. Poster presenters were given a minute to explain why participants should visit their poster presentations of about 10 minutes. This allowed longer presentations and discussions with people interested in particular topics. The presenters then gathered on stage for open questions and discussions. Lots of movement and engagement.

I kept a list of those papers that I found particularly provocative, useful and interesting. They taught me a lot and raised new questions. My favorites fell in six broad categories of my own creation. I plan to report more fully on each group in the coming days once the papers are posted on-line.

1) Theory, particularly those on waste, complexity, socio-technical systems
   a) Which are the wastes of construction? Koskela et al.
   c) Management Cybernetics as a theoretical basis for lean thinking. Steinhaeusser.
   d) Contributions of existing practices to pursuing value. Tillman et al.
   e) Optimizing Workflow for shelter rehabilitation projects in a refugee camp. Eljazzar et al.
   f) Value Stream Mapping in Housing Design, Leite et al.

2) Leadership
   a) Construction Kata: Adapting Toyota Kata to a Lean Construction Project Production System. Casten et al.
   b) Learning to see - managers working in the gemba as part of the TIdhar way of training. Kerem et al.
   c) Teaching lean construction – perspectives on theory and practice. Tsao et al.

3) Choosing By Advantages
   a) Using 'choosing by advantages’ to select ceiling tile from a global sustainable perspective. Arroyo et al.
b) Inference-assisted choosing by Advantages. Haymaker et al.

c) Selection and application of Choosing by Advantages on a corporate campus project. Abraham et al.

4) Production Management

a) Takt time planning for construction of exterior cladding. Frandson et al.

b) An experiment in takt time planning applied to non-repetitive work. Linnik et al.

c) Bullwhip effect in production control: a comparison between traditional methods and LPS®. Pereira et al.

d) Propagation and distortions of variability into the production control system bullwhip of conversations of the last planner. Zegarra et al.

e) Supplier quality surveillance practices in construction. Alves et al.


5) New Frontiers

a) A case study of last planner system implementation in Nigeria. Ahiakwo et al.

b) The role of owners in the supply chains of highway construction projects: an overview of Indonesian cases. Wirahadikususmah et al.

c) Construction permits and flow pf projects within the Sunyani Municipality, Ghana. Kpamma et al.

d) Lean supply chain decisions: implications for construction in a developing country. Emuze et al.

6) Social Networks

a) Social network development in last planner system. Priven et al.

b) Social network analysis a diagnostic tool for information flow in the AEC industry. Alarcon et al.

c) Social network analysis of information flow in an IPD-Project design organization. Hickethier et al.