

PowerWorld Formation, Development and Growth



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PowerWorld
Corporation

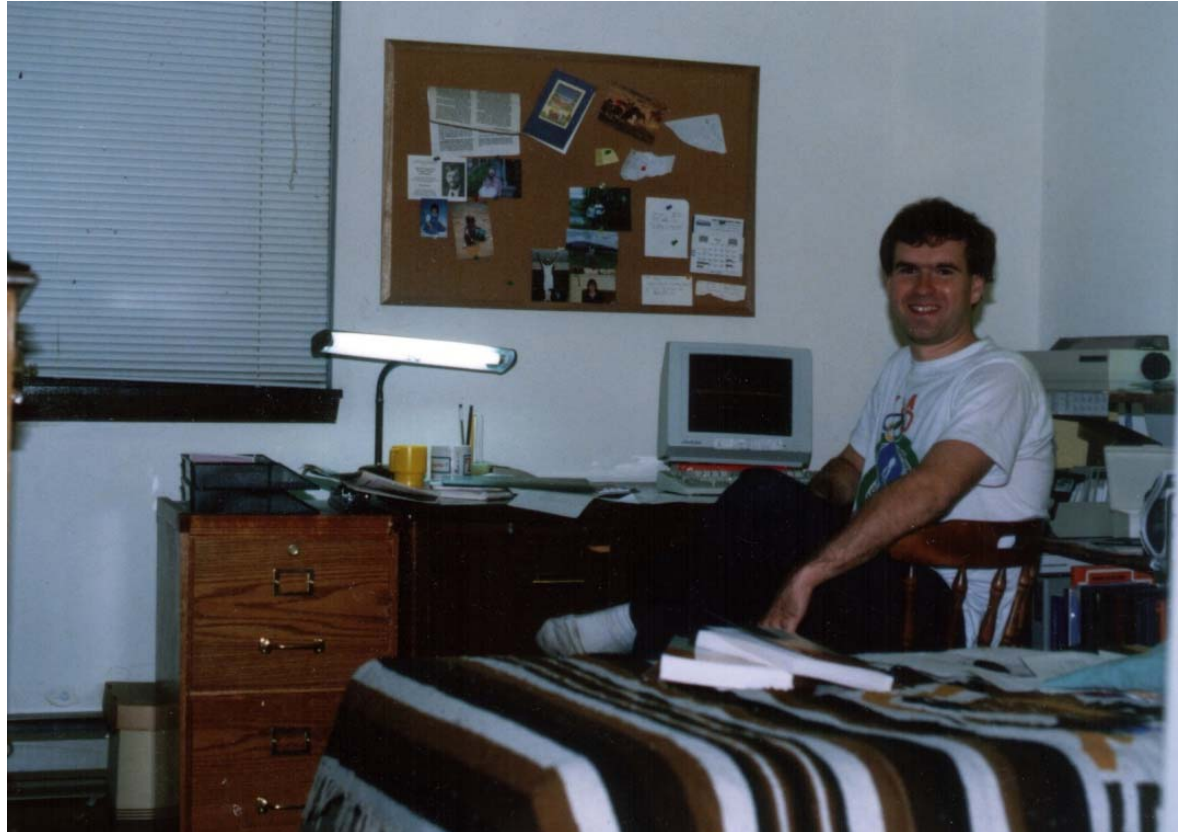
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Early Development of PowerWorld Simulator

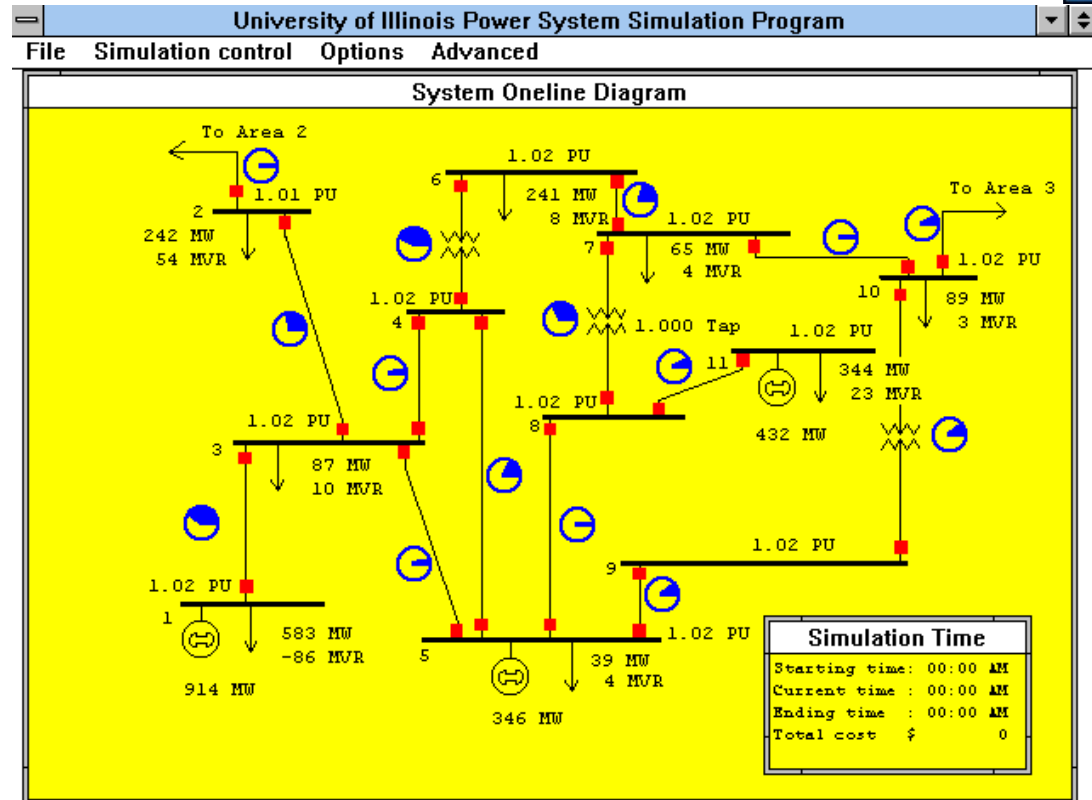


- Tom Overbye started writing the code that ultimately became PowerWorld Simulator in early 1987, using an 8088 computer Turbo Pascal.



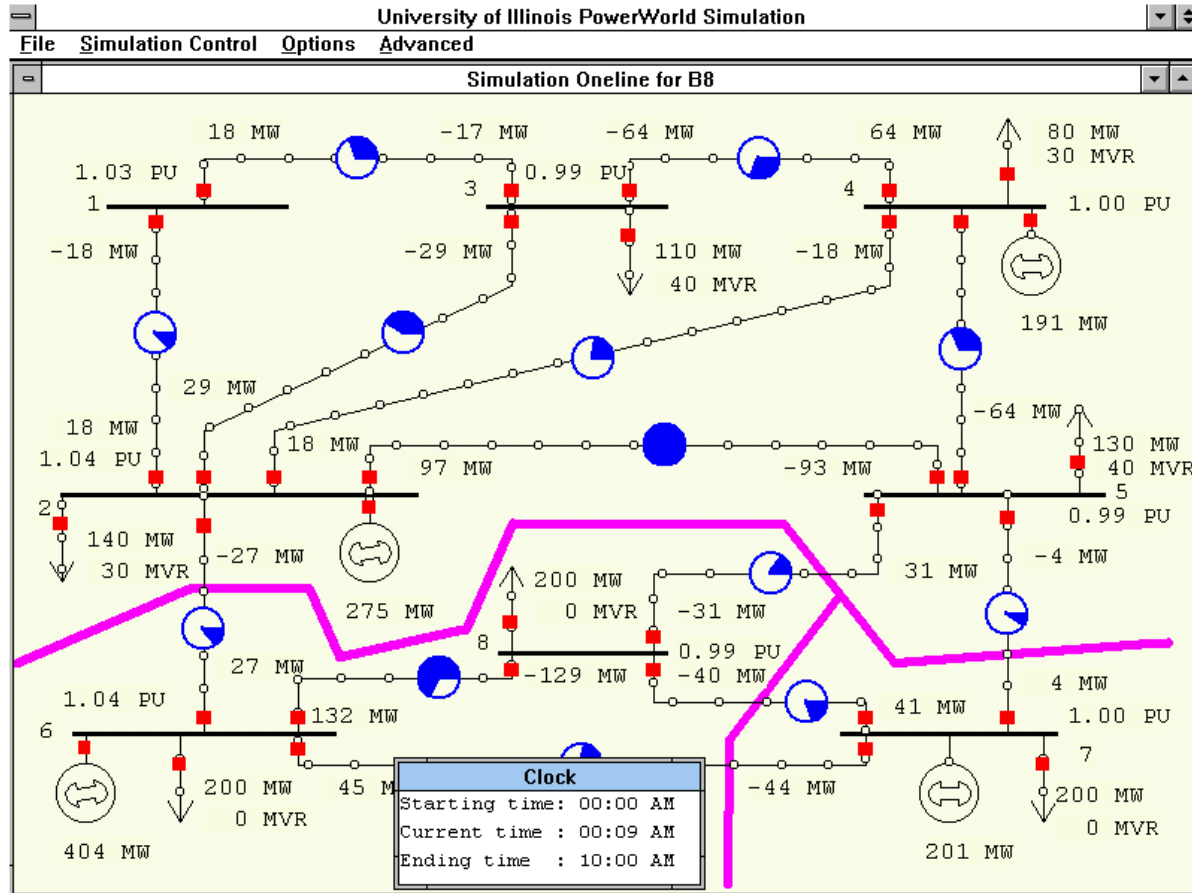
Birth of PowerWorld Simulator

- PowerWorld Simulator was “born” in Spring 1994 by Overbye merging the power flow code with the visualization concepts from the 1993 short course.



PowerWorld Simulator originally had no flowing arrows and no ability to pan or zoom.

Further Development Continued Through 1994 to 1996



A key driver for this development was the desire by some utilities to visualize transmission issues.

PowerWorld Corporation is Incorporated in April 1996



Starting in early 1996, Overbye thought PowerWorld Simulator could become a viable commercial product. Luckily he had an entrepreneurial grad student willing to take a risk.



Total revenue in 1996 was about \$20K and grew to \$125K in 1997.

Company and Product Progress



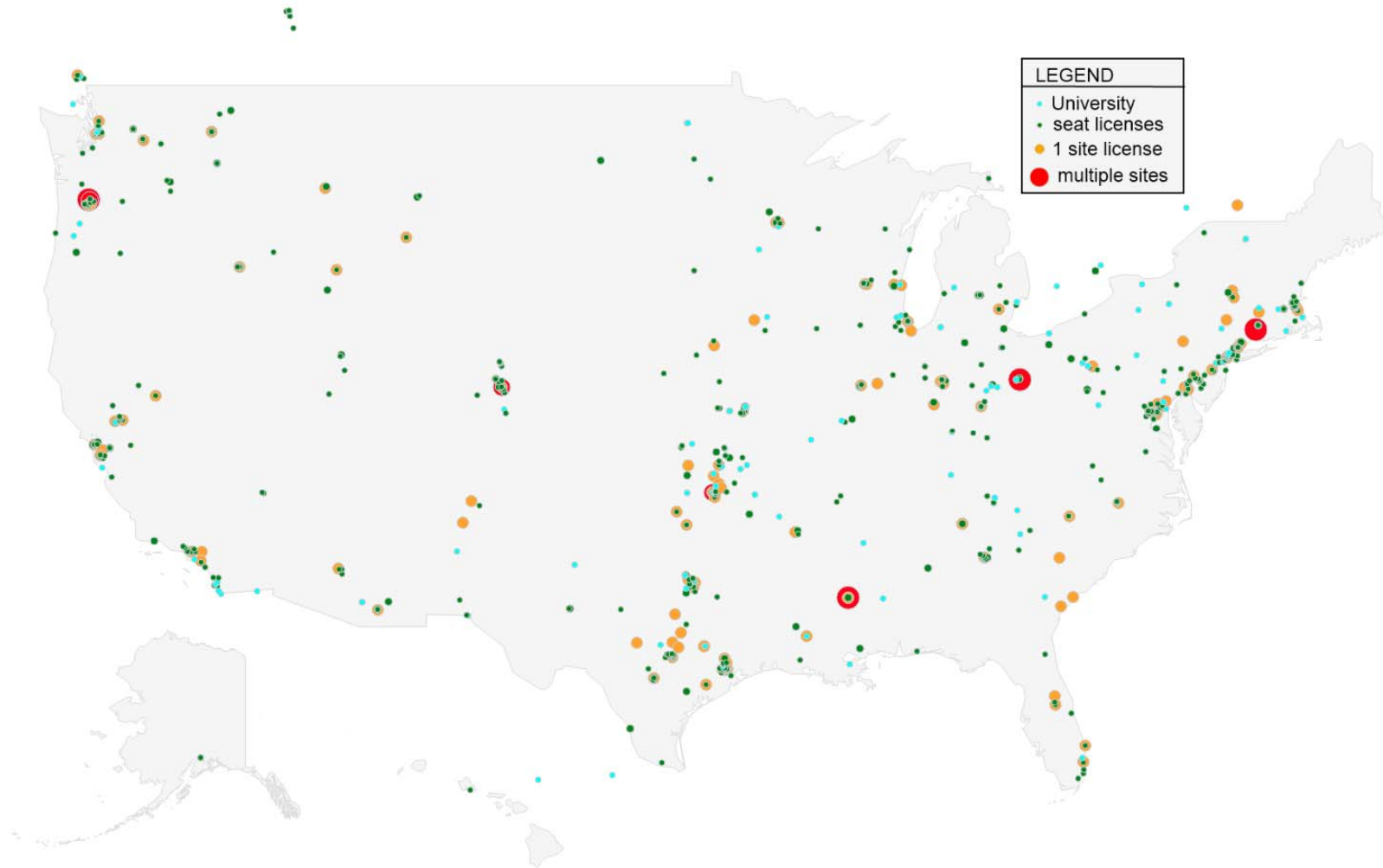
- New Products Since Inception
 - Optimal Power Flow/Voltage Stability/Transfer Capability
 - Transient Stability
 - Geomagnetic Storm Analysis
 - SimAuto Automation Server
 - Contouring
 - Real-time data visualization and simulation (Retriever)
 - Full Topology Models
 - RAS
 - Distributed Computing
 - Builder

PowerWorld Today

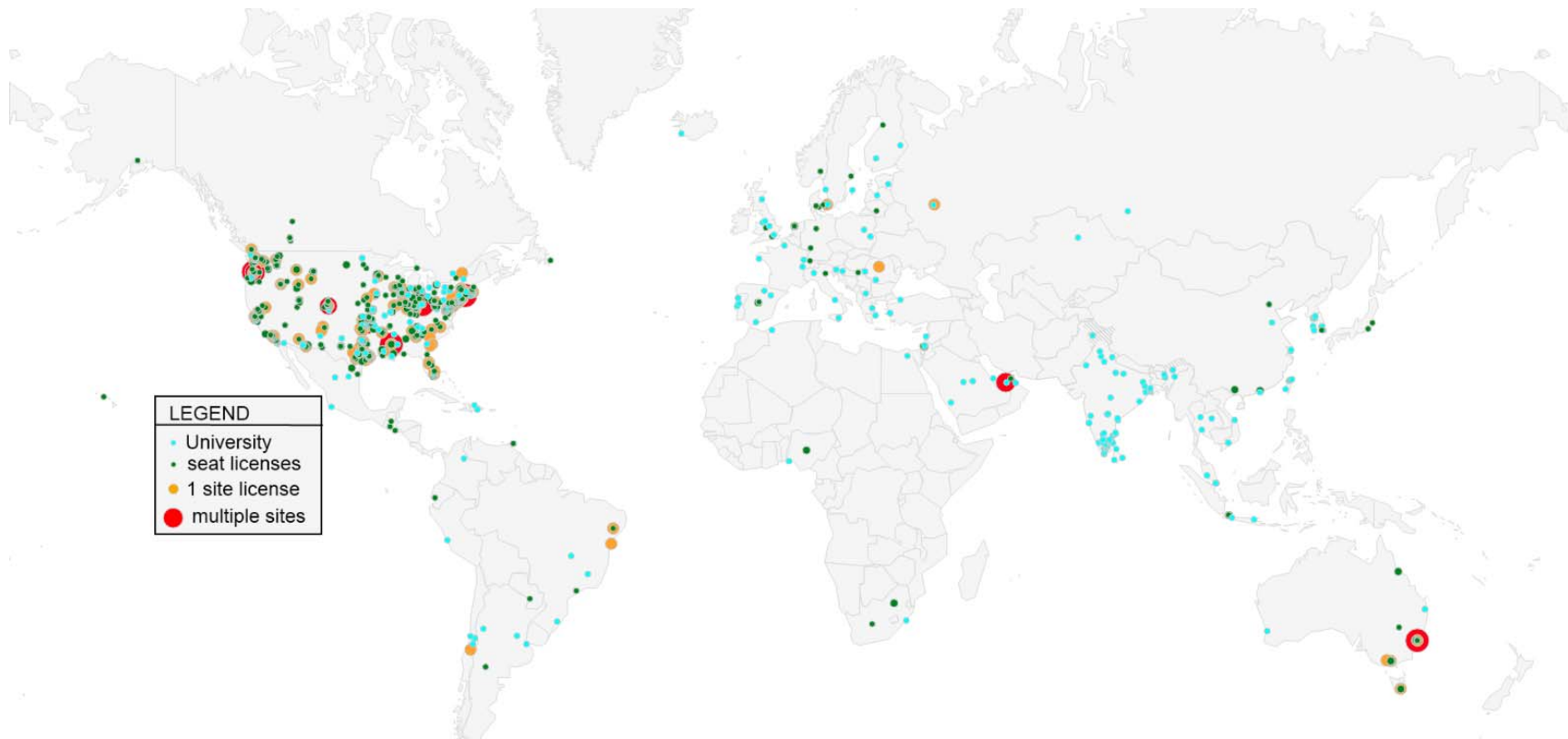


- Today: Simulator version 20
 - Virtually unrecognizable from the early versions of the software
 - Many new products and tools
 - Has evolved into a powerful power system analysis and visualization environment capable of solving very large systems
 - Company now has 13 full time employees, including several Ph.D.'s and graduate student interns

Customers



Worldwide Customers



Financial Status



- Never had any outside investment
- Never had any debt
- Always been profitable (no choice!)
- Still a very similar ownership structure to inception
- No one to answer to except the customers
- Our primary purpose is to write and support this software

The PowerWorld Philosophy



- An overriding company goal has been to work closely with our customers to provide the best possible power system visualization and analysis software, and top-notch customer service.
- As a small company when somebody calls or emails PowerWorld they quickly get to interact with the people doing the actual software design and development.
- Having great employees definitely helps!

PowerWorld Software Development Team

– 9 permanent people



- Tom Overbye, Ph.D. (1994 and before)
 - Company founder and a professor at University of Illinois
- Jamie Weber, Ph.D. (1997)
 - Director of Operations
- Kollin Patten, M.S.E.E. (1997)
 - Director of Engineering
- Kyle Johnson, B.S. C.S. (2003)
- Caroline Marzinzik, M.S.E.E. (2004)
- Matt Davis, Ph.D. (2009, part-time 2003)
- Angel Aquino-Lugo, Ph.D. (2010, part-time 2007)
- Thomas Nicol, M.S.E.E. / B.S. C.S. (2011)
- Saurav Mohapatra, Ph.D. (2016, part-time 2012))

PowerWorld Software Team Support



- All developers are involved in all parts of the software process
 - Write software
 - Provide email and phone support
 - Give training
 - Write help documentation
 - Communicate with customers regarding potential new features

PowerWorld Corporation Development Process Summary



- Flexible Development
- All developers are involved in every facet of the process
 - Ensures that knowledge is not locked in one employee
 - Clients can talk to any of us and get help
- Customers drive the development
 - Customer feedback is vitally important to us

How PowerWorld decides what new features to develop



- Bug fixes come first
 - New development must wait for bug fixes to be complete
 - Bug fixes are sent out via the patch website
- Agile Programming Rule – Customer Feedback
 - When a few customers request a simple change it will be made immediately
- For Larger software modifications
 - Market Need
 - Is there a big enough market to support the development costs of the software tool?
 - Customer cost-sharing and testing arrangement is typical
 - Historically, PowerWorld has between 2 and 4 cost-sharing arrangements going on at all times
 - Range of these projects is \$1,000 - \$400,000
 - Most projects are \$20,000 - \$40,000 (a couple man-months)

What the Customer gets from a Cost-Sharing Arrangement



- Work with a company with a proven track-record of providing software that meets their customers needs and supports the software after completion
- Get to drive the development of an important software tool using outside software developers
 - More cost-effective than writing custom software
 - Customizations integrated in Simulator are maintained and supported by PowerWorld going forward
 - Software is tested by the PowerWorld User-Community as a whole
- Customers' staff is able to become intimately aware of the functionality of PowerWorld
- Minor requests from cost-sharing clients are typically added at no cost

What PowerWorld Gets From a Cost-Sharing Arrangement



- Agile Programming Principles
 - Customer is intimately involved in designing the software needs
 - Customer contributes their own staff time to providing feedback and testing
 - PowerWorld staff learns tremendously from the customer interaction
- Defrays the development cost
 - Not looking to recoup all our costs
- Proves that the enhancement meets a market need