

Using GoldSim to Reduce the Cost and Increase the Effectiveness of Modeling and Simulation Within Government Organizations

GoldSim is a powerful and highly graphical software program developed by the GoldSim Technology Group for simulating complex systems in engineering, science and business. In addition to providing powerful technical capabilities, the software can significantly reduce the costs associated with simulation efforts and increase the effectiveness of such programs when implemented in a coordinated manner throughout a project or an organization. The technical capabilities of GoldSim are described in detail elsewhere (www.goldsim.com). This short document summarizes why GoldSim is such a cost-effective solution, and how it can increase the effectiveness of modeling and simulation projects within government organizations.

GoldSim is a High Quality Commercial Software Tool with a Worldwide Reputation

GoldSim is the product of over 30 man-years of research and development, and the user interface and internal algorithms are highly developed and tested. GoldSim is not a “research project” or a “work in progress; it is a well-established, proven, commercial software product that is being successfully used to solve real-world problems not only in the US, but in government agencies worldwide, including the United Kingdom, Spain, Germany, France, Japan, Taiwan, Hungary, and the Slovak Republic. One point that is often overlooked when purchasing software is the degree of ongoing support and upgrades that are available. Research laboratories and universities who produce software typically provide a very low level of support and upgrades (if any at all), since the individuals who created the software often move on. As a result, once the software is created, it is often difficult to address bugs or add new features. The GoldSim Technology Group takes pride in our responsiveness to user requests for modifications and enhancements, superior technical support, extensive documentation, expert consulting services and training seminars. We have been providing these services to our customers for over 10 years.

GoldSim is Already Widely Used Within the US Government

GoldSim (and its predecessor) have been used by the US DOE Yucca Mountain Project since 1992. The recent Yucca Mountain Site Recommendation was based on a detailed GoldSim simulation model of the Yucca Mountain site. Los Alamos National Laboratory is using GoldSim to aid in characterizing risks and to identify monitoring requirements for low-level radioactive waste disposal areas. The National Nuclear Security Agency at the Nevada Test Site is using GoldSim to evaluate alternative remediation strategies at several disposal sites and contaminated areas. GoldSim is also being used to develop decision making tools for large stakeholder groups. For example, GoldSim was used by the Idaho National Engineering and Environmental Laboratory to develop infrastructure models of Yellowstone National Park to evaluate proposed changes both within the Park and the surrounding communities.

GoldSim Encourages a Top-Down Approach

Many complex modeling efforts lose sight of the “big picture”, and much time and effort can be spent adding unnecessary details to a model. Modeling studies often turn into “research projects” instead of applied science and engineering efforts focused on a specific goal. Although GoldSim models can be very detailed if necessary, the software is designed such that it encourages a top-



down approach to modeling, in which the model is developed in an iterative manner, and details are only added when warranted. This keeps modeling projects focused and goal-oriented.

GoldSim Allows Models to Be Built Very Rapidly

The GoldSim user interface allows users to build and modify models very rapidly. The time savings over programming an equivalent model “from scratch” is typically ten-fold or more. Moreover, GoldSim’s built-in configuration management tools (such as the ability to record the changes made to a model over time) ensure that modifications are made in a traceable and organized manner. As a result, an iteration of a GoldSim model can be carried out within a timescale of days or weeks, rather than the months required for many other modeling frameworks.

GoldSim Facilitates Effective Interaction with Stakeholders

The ability to create hierarchical, top-down models, coupled with GoldSim’s powerful documentation features, allows you to design transparent, highly-graphical models that can be effectively explained to any audience at the appropriate level of detail. Moreover, GoldSim facilitates real-time model experimentation (e.g., the ability to answer stakeholder “What If?” questions during a meeting). Transparent, easy to understand models and real-time model experimentation promotes effective interaction with regulators and other stakeholders, and helps to build trust. This ultimately can help you avoid costly delays and requests for additional (and technically unnecessary) modeling studies or data collection.

GoldSim Allows Models to be Re-Used and Shared Across a Project or Organization

GoldSim models are built in a hierarchical and modular manner, by creating and linking together subsystems (submodels). The sub models can include custom (legacy) codes that can be linked dynamically into GoldSim. These sub models, after being built for one application or project, are often readily transferable with only minor modifications to another application. The GoldSim framework is designed to allow submodels to be saved (and perhaps posted to an organization-wide website), and then re-used in other models for other projects within the organization. Sharing and re-using submodels in this manner can result in significant cost savings by eliminating the need to “reinvent the wheel”. In effect, GoldSim acts as a framework to share knowledge and experience across the organization. Not only does this reduce redundant efforts, it promotes consistency in the assumptions and approach to environmental modeling within the organization.

The GoldSim Technology Group Can Rapidly Customize GoldSim for a Particular Organization

The advantage of commercial software (as opposed to research software) is primarily in the high quality of the user interface and algorithms, the degree to which the software is tested, and the quality of the documentation and support. The advantage of research software is that it can be easily and rapidly customized to meet a particular organization’s needs. GoldSim offers the best of these two worlds. It is a state-of-the-art commercial product, but it was designed from the outset (using object-oriented programming techniques and a modular design) to facilitate rapid customization. We have worked effectively with the US DOE for over 10 years in this way, adding features and responding to requests, typically within days of the request.

For more information, visit our website at www.goldsim.com, email us at software@goldsim.com, or call the GoldSim Technology Group at 1-425-295-6985.

