

## HDR|DTA Software Helps Hydro Owners Make Informed Decisions

AS INTEREST IN RENEWABLE ENERGY resources grows, having a tool that can quantify gains from upgrades or changes to hydroelectric systems can help owners make informed decisions with limited budgets while maximizing use of natural resources. While there is no crystal ball to show project owners the final costs or performance reliability of a hydropower system upgrade or a lengthy relicensing process, a proprietary software program developed by HDR|DTA can be the next best thing.

The Computerized Hydro Electric Operations and Planning Software, or CHEOPS™ is a VisualBasic®-based application that can be customized to evaluate the economics and performance of water resources elements in a variety of disciplines. For example, civil engineers can use CHEOPS™ to evaluate generation, dam, powerhouse, erosion and related concerns; mechanical/electrical engineers can use it to determine powerhouse limitations and gauge the benefits of upgrading equipment; biologists can use it to assess habitat and water quality values.

For example, Federal Energy Regulatory Commission (FERC) relicensing projects consume time, resources and expertise, with negotiations among widely disparate stakeholders, from hydropower system owners to river users (fishermen, kayakers, etc.) and cities that will use the hydropower. CHEOPS™ can take this myriad of features into account to evaluate the economic feasibility of system upgrades. This allows HDR|DTA hydropower clients to negotiate based on a detailed understanding of the path and consequences of nearly every drop of water.

### FROM SPREADSHEET TO STAND-ALONE APPLICATION

Developed in the late 1990s, CHEOPS™ evolved from a spreadsheet to a stand-alone Visual Basic application. According to John Devine, senior vice president and national client director of Hydropower services, "It started with the idea that the industry had a need and desire for a cost-effective, yet robust, tool to evaluate operational options at single- and multi-plant hydro projects and systems. It has now been used on well over 150 projects in the US and internationally." HDR|DTA rebuilt the software last year to bring it in line with current trends in Windows Operating Systems and to work with the Microsoft .NET framework. The result is a more user-friendly interface, with model runtime decreased by nearly 90 percent. HDR|DTA software developer Brian Krolak explains, "The recent upgrades

let CHEOPS™ users add or remove system features and streamlines code distribution to clients."

CHEOPS™ offers HDR|DTA clients the ability to simulate operation and energy production for many types of projects and can be used to:

- Estimate long-term energy production and revenue streams
- Evaluate upgrades, modifications and operational changes to increase energy production and maximize revenue
- Determine dependable capacity based on critical water year

"Working with clients and stakeholders to determine the optimal resolution that extracts the maximum benefit for all concerned parties is both challenging and enjoyable."

Brian Krolak, CHEOPS™ software developer

### REAL WORLD RELIABILITY

HDR|DTA has used CHEOPS™ on hydropower projects from Alaska to Maine. An example of a recent application was associated with the relicensing of the Osage Project that includes the Bagnell Dam that impounds Lake of the Ozarks on the Osage River in central Missouri. To assess the impact of operational options on energy generation (total/on-peak/off-peak), lake levels and revenue from energy generation, HDR|DTA used CHEOPS™ to model alternative scenarios. The system owner used the modeling results to help stakeholders understand the impact of each option for more informed decision making. □

