Westinghouse Hanford Chooses GeoLink For Environmental Mapping

At 560 square miles, the Hanford Superfund site represents one of the largest and most complex engineering challenges in the world. Hanford, located in the desert of eastern Washington State, is the site where many of the key facilities of the U.S. atomic weapons program were located. It is also the site of the early reactors where the feasibility of commercial power reactors and preparation of medical isotopes were first researched and developed. This research, which was conducted under the urgency of wartime and cold-war defense needs and the uncertainties of nuclear technology, resulted in the contamination of certain portions of Hanford with radioactive waste and pollution. Subsequently, in an effort to put bad news to good use, the U.S. Government has designated Hanford a National Environmental Research Facility. Hanford has been transformed from a nuclear waste site into an environmental restoration mission.

As the operating contractor of the Hanford site, Westinghouse Hanford Company has made the desert bloom with new technologies which they hope will yield better methods of environmental cleanup. Westinghouse has also contracted with the Department of Energy to establish Cooperative Research and Development Agreements (CRADA's) to encourage the growth of commercial spinoffs from new technology applications. The unique challenges of the Hanford site have brought together the wit and wisdom of every industry in America, including the new technologies of the Global Position Satellite (GPS) industry.

Westinghouse Hanford has selected GPS/GIS technology to create a highly accurate map of radiological intensities over the large affected surface and subsurface areas at Hanford. Westinghouse chose to use GeoResearch's GPS/GIS mapping product, known as GeoLink, for the speed, accuracy and cost-efficiency with which it acquires field data. The precise data requirements of the project demanded more than just sending a dozen people out with hand-held detectors to take manual measurements. As Marc Wendling, a member of Westinghouse's Environmental Restoration Health Physics Department, puts it, "Previously, radiation readings were taken by walking through the brush, taking readings and hand-drawing maps with no consistent reference points. With GeoLink, we can overlay our rad survey map on an existing base map of the area. We know where these readings were taken and can verify adequate coverage of an area. Even better, the map readings are reproducible—you can go back to the exact same spot five years later, or even twenty years later and compare readings. GeoLink allows us to characterize unknown areas and to track and trend known radiologically controlled areas. We couldn't pull it off without GeoLink".
The specific demands of the mapping project called for creative solutions. As a result, the Environmental Restoration Health Physics Group of Westinghouse Hanford created a rugged detection system which attached GPS/GIS GeoLink's External Data Source (XDS) system to a roving unit. GeoLink's XDS system will allow external data sensors to feed data while the unit is in motion, directly onto a map. Officially called the Mobile Surface Contamination Monitor II (MSCM-II), the system consists of a large farm-type tractor equipped with a fifteen-foot wide detector array and a GeoLink XDS mapping unit. The tractor, rolling across the desert surveying rads, is affectionately nicknamed the "Rad Rover."

GeoLink will correlate the radiological readings provided by the detection array with the locational information provided by a GPS sensor. The tractor driver views the survey on video monitors mounted in the tractor cab. Position and detector data are updated once per second with the map scrolling automatically to the current view. Any measured radiation values even slightly above background are flagged in red on the screen and marked on the map. The operator is thus immediately aware of contamination patterns. The system will typically be operated by sweeping a pattern back and forth across the survey area to cover the entire land surface and provide assurance that any detectable contaminants have been located. Previous survey data may also be incorporated into the on-screen background map and the system can return accurately to resurvey questionable areas.

The "Rad Rover" will operate at a speed of approximately 2 miles per hour to maintain appropriate sensitivity. At this rate, nearly four acres will be surveyed per hour, a great increase in productivity. Other side benefits of the system include better safety and comfort for field workers. Both the truck operator and the health safety technician will travel inside the enclosed cab well above the possibly contaminated surface of the soil.

GeoLink automatically formats the collected data for storage in a Geographic Information System (GIS) for creation of radiological surface and subsurface maps. The maps will become essential planning tools for appropriate implementation of cleanup as well as a source of exact data for radiological research.

The precision and speed of GPS/GIS data collection is rapidly putting this technology front and center for environmental mapping. Commercial applications for GeoLink XDS are being constantly redefined by the needs of the end user. For police, emergency and insurance workers, GeoLink XDS provides an easy method for quick radiological surveying and bomb detection. The GeoLink system can be efficiently operated by a single technician, without a high degree of training, on foot or in an operating vehicle. GPS technology is rapidly evolving from a simple navigational tool into a reliable and affordable means of sensing and mapping our environment.