

For Immediate Release:

New Process Saves Las Vegas Valley Water District a Potential \$300,000 on Pump Station Life Cycle Cost

New York, May 24, 2006 — The Las Vegas Valley Water District (LVVWD) recently identified a potential savings of \$300,000 over the original life cycle cost estimate for their latest pump station. How did they do it?

An interdisciplinary team from LVVWD was led through a unique conceptual design review process before the pump station Scope of Work was finalized. The Conceptual Design Review process drives increased value for utilities by incorporating higher standards of reliability and maintainability in the development of Request for Proposals (RFP's).

The five step Conceptual Design Review process includes Reliability Centered Maintenance (RCM) — a method credited with revolutionizing reliability in the airline industry. Before applying RCM to airline maintenance in the 1970's, there was an average of 60 plane crashes per million takeoffs — 67% due to equipment failure. The failure rate has now been reduced to less than 1 plane crash per million takeoffs and less than 0.02% of those are due to equipment failure.

Reliability Centered Maintenance is increasingly being applied in the water/wastewater industry because it enables managers to identify the required functions of equipment and the actual consequences when those functions fail. The rigor of the methodology provides a stable collaborative platform for managing the increasing health, safety and environmental risk factors that face utility managers because of aging infrastructure.

But the even broader challenge that led to the breakthrough work at Las Vegas Valley Water District can best be summed up in the following 3 concerns:

- How can we make the right repair or replace decisions at the right time based on the life cycle costs?
- How can we both demonstrate improved financial stewardship and build consensus for the needed infrastructure improvements based on the specific risks of failure?
- How can we design and build more reliable and maintainable plants at the lowest life cycle cost for our stakeholders and customers?

New Dimension Solutions, a specialist in Reliability and Enterprise Asset Management (EAM) solutions, developed the Conceptual Design Review process in collaboration with the Orange County Sanitation District. (OCSD) managers face 2.5 billion dollars worth of infrastructure renewal and expansion projects over the next 15 years. OCSD wanted to incorporate reliability and maintainability into future designs to better control operational and maintenance costs over the life cycle of the new plants.

The proof of concept work was done on OCSD's Bitter Point Pump Station project, which was already 50% through the traditional design cycle. The difference between the choices made using the standard process and what emerged from the internal team using the new process was dramatic. Since the Conceptual Design Review process begins with no preconceptions, it was possible to separate design

preferences and past conventions from the actual functional requirements of the proposed pump station in its own unique operating context. Based on the results from the Bitterpoint Pump Station project, OCSD management immediately recognized the potential of the process and incorporated it into their design criteria for future projects.

Charles Scott, Maintenance Engineer for the Las Vegas Valley Water District learned of the OCSD work and hired New Dimension Solutions (NDS) to apply the process to the next pump station in their design schedule.

The five steps of the Conceptual Design Review process are:

- 1) Define Operating Context and Required Functions for the system selected, and develop a Risk Threshold Matrix that links failure consequences to the client's unique Business Objectives
- 2) Perform Equipment Failure Analysis (based on maintenance records of like equipment and from NDS' extensive component failure libraries)
- 3) Set required levels of system reliability based on functional failure consequences using Reliability Centered Maintenance (RCM)
- 4) Determined critical spares by drilling down from system failure consequences to effects of a stock-out for a critical component (i.e. How will level of service be affected?)
- 5) Optimize the functional design for required reliability at lowest life cycle cost using computer simulation of failure data generated from Step 2 with feedback loop to Step 1 for enhanced strategic planning and process improvement.

The District team found the Conceptual Design Review process empowering. The process encouraged dynamic collaboration early and increased their sense of leverage. Valuable insights were shared, and synergy created across disciplines using the function-centered language of RCM. Finally, members of the team felt that the rigor of the methodology would provide a platform for increasing the standardization of future designs, producing both further cost savings and the possibility of even more reliable designs. Las Vegas Valley Water District management is currently moving to incorporate the process into their design guideline documents.”

Marius Basson is Vice President for RCM Services with New Dimension Solutions. “What makes our process so unique is that we can optimize for reliability early enough to impact the actual RFP. A zero-based, functional approach reduces design complexity, which will reduce change orders during construction. Integrating reliability and maintainability into the design up front reduces problems in commissioning and plant startup. And because we use RCM, that plant will start off with a fully developed operational philosophy and maintenance plan (with critical spares identified). And everything is logically linked and strategically integrated back to the actual risks and business objectives of the client. And this is key because every plant today operates in three environments: physical, regulatory and stakeholder. The rigor of this process captures important community values like sustainability and energy efficiency in a transparent collaborative platform that can quickly build consensus for taking needed action.

“The savings created by making the right decisions early continue to cascade and magnify through the entire project life cycle: design, construction, commissioning, operation through the plant's entire

useful life and finally decommissioning. The power and foresight this process gives to decision makers is staggering. Reliability-focused RFP's will revolutionize how design and builds are done. Municipalities are facing daunting levels of financial investment in infrastructure. It is a national challenge. The Conceptual Design Review process focuses on improving the design and build process itself, before those hundreds of billions are spent.

"Each RFP sets the conditions for everything that follows. We believe municipalities and utilities can revolutionize this industry by developing reliability centered RFP's. That is our vision and commitment at New Dimension Solutions. We thank OCSD and LVVWD for their leadership. In the midst of this national infrastructure challenge, they are setting a new standard for financial stewardship, one that all utility stakeholders and customers will increasingly demand."

About New Dimension Solutions, Inc

New Dimension Solutions (NDS), www.nd-solutions.com provides world-class services in Enterprise Asset Management and Reliability. Professional Service offerings include application and industry consulting, training and facilitation as well as project services addressing the complete project life-cycle from opportunity analysis through implementation and continuing support. NDS focuses on Asset Intensive industries and just completed a two year study on the application of RCM to the water utility industry for the American Water Works Association Research Foundation (AwwaRF Report # 2953)

About Orange County Sanitation District (OCSD)

OCSD collects, treats and disposes of wastewater generated by 2.3 million people living over a 470 square mile area of northwest and central Orange County California. The District maintains over 650 miles of pipe and multiple pump stations ranging in size from a few hundred thousand gallons/day to 16 million gallons/day. After properly treated the wastewater is released through a pipeline on the ocean floor 4 miles off of the coast of Huntington Beach at a depth of 200 feet below the surface.

About Las Vegas Valley Water District (LVVWD):

LVVWD is a not-for-profit agency that began providing water to the Las Vegas Valley in 1954. The district helped build the city's water delivery system and now provides water to more than one million people in Southern Nevada. The Las Vegas Valley population continues to expand rapidly and LVVWD manages the design and construction of between 2 and 3 new pump stations / reservoirs per year to meet the increasing demand.

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