



CONSTRUCTION in a WAR ZONE

With projects in both Afghanistan and Iraq, Perini Management Services navigates everything from bad weather and equipment shortages, to unexploded land mines and an active insurgency.

By Janet Kreiling / Photos courtesy of Perini Corporation

Being denied site access by AK-47s wielded by a local warlord's guards doesn't figure into most project "what-if" scenarios. Just as time to search for unexploded mines and clear thousands of abandoned munitions and bits of materiel doesn't figure in most site prep schedules. In Iraq and Afghanistan, extreme unpredictables including ongoing insurgency must be added to run-of-the-mill bad

weather, resource and equipment shortages (not a backhoe to be found in all Afghanistan), and difficult topography.

"In an environment like this, communication becomes absolutely crucial," says Rob Forrester, manager of project controls for Perini Management Services, Inc., a division of Perini Corporation that was contracted by the U.S. Army Corps of Engineers to build electrical

infrastructure in Iraq and bases for Afghanistan's National Army.

Forrester and his team needed modern telecommunications between the job sites and the project control teams in Perini's headquarters in Framingham, Mass., as well as the

carried out five major electrical infrastructure projects in Iraq as part of the Restore Iraqi Electricity (RIE) program. The company rehabilitated two gas turbine generators at the Khor Az-Zubayr power station in southern Iraq to their original rated

been seriously damaged by war and neglect. The projects were generally complex, the rehabs often including complete disassembly of whatever existed at the site, inspection, and replacement of many components. Construction of new power generating units included site prep, engineering and construction of the unit, and design of ancillary structures such as fuel containment tanks.

Some of the work took place in zones of active insurgency, and site prep often started with munitions removal – in some cases, UXO (unexploded ordnance) crews were required. Perini was responsible for the security of its own employees, contractors and subcontractors, as well as personnel from the Army Corps of Engineers. The need for security spanned the project and equipment sites, housing compounds, and the routes traveled between them.



Perini and U.S. Army Corps of Engineers personnel test the concrete for use in building a new turbine generator at Nasiriyah Power Plant.

ability for the on-site project staff to collaborate with their respective local control teams in the regional offices.

To facilitate that, Perini created its own bicontinental wireless telecom network – using Iridium satellites, voice over Internet protocol, and e-mail – to link staff members in Framingham with on-site staffers in Afghanistan and with a control team in Kuwait that has personnel in Iraq. The network allows the teams to keep current on all project details, including the AK-47-enforced delay (which was resolved in a few days) via Primavera software.

POWERING IRAQ

Since being awarded the reconstruction contracts in 2003, Perini has

capacity of 63 MW each. It repaired 360 km of 400-kv transmission lines and replaced some 330 power line towers. The company installed a 40-MW dual fuel gas and distillate turbine generator at an existing power plant in Nasiriyah. It assessed 23 substations throughout south and central Iraq, including 11 in the Baghdad area, and rehabilitated nine of them. In addition, Perini installed a 40-MW dual fuel turbine generator at Buzurgan, a remote site that previously had been very poorly supplied with utility power. It's the first completely new power plant to be built in Iraq since 1976.

UNIQUE CHALLENGES

Many of the country's facilities had

REBUILDING AFGHANISTAN

At the same time, Perini was also rebuilding in Afghanistan. The company was one of three contractors selected to rebuild two bases that had been abandoned in 1994 by the Russian army – Pol-E-Charki and Darualaman Garrison near Kabul – for the use of the Afghan National Army (ANA). In 2004, Perini was awarded contracts to build two complete new ANA bases, one at Mazar-e-Sharif in the north, and the second in Gardez in the east. That work included the construction of administration buildings and barracks, power plants, communications systems, dining facilities, and water and



Colorful trucks from Pakistan are commonly used in Afghanistan.

sewage treatment facilities.

DESIGN/BUILD FOR SPEED

Speed on these projects was crucial. Iraq needed electricity to power its rebuilding. And in Afghanistan, the Afghan army was training new soldiers at the rate of 600 every five weeks, all of whom needed to be housed. Because of the extreme fast tracking of projects in both countries, they were all structured as design/build. “In building the new bases, we were continuing with the design almost until they were finished,” Forrester says. “We’d begin construction – putting in footings and laying the foundation – while the overall design was still in the concept stage. Design/build allowed us to finish in 60 percent of the time that a more traditional design/bid/build process would have taken.”

Just one year after Perini was awarded the RIE contract in Iraq, the job was completed. The new power plant at Buzurgan was designed and built in just ten months, which Robert Band, Perini Corporation’s

president and chief operating officer, describes as “quite a feat.”

The two new ANA bases in Afghanistan were contracted for in July, 2004, and are scheduled for completion in April. On those jobs, Forrester says, “We were breaking ground within a few weeks of the project kick-off meeting.”

Design/build, of course, makes

heavy demands of planners and project managers – and their software. In addition to the personnel on site, the projects were supported by design and engineering teams in

Framingham, and by regional offices in both Kabul and Kuwait. The Primavera software for Iraq resided on servers in Kuwait, and for Afghanistan, back in Framingham. On-site personnel accessed the software over the Web using wireless-equipped laptops.

PLAN, PLAN AND REPLAN

Given the political situation and the challenging landscape, good documentation, scheduling, and back-up plans were essential. Scheduling had to accommodate the unique problems of the terrain. In one instance, equipment was too big for the narrow mountain tunnels near a base whose elevation is 6,000 feet. The long way around took four more days. A great deal of heavy equipment had to be moved over frozen mountain passes, and heavy, bulky goods might be unloaded and reloaded many times on the journey.

Sometimes time was more important than money. The most common transport route to Mazar-e-Sharif was by ship to the Port of Karachi, then by land to the Pakistan-Afghan

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– Rob Forrester, manager of project controls, Perini Management Services

border and on through Kabul. But if time did not permit, the back-up was by air freight direct to the base – at a cost four times that of the land and sea route.



A buried tank and nearby shells are just some of the hazards in conducting surveys for projects in Iraq.

“What-if analyses were really crucial,” Forrester says. “We were doing them constantly in the background to have alternatives in place – sometimes three or four – if we needed them. We had to have that air freight strategy all mapped out. And we had to be absolutely up to date on all other aspects of the project so we could see where we were on budget and whether we could absorb the added cost.”

COLLABORATION VIA PRIMAVERA

The conditions of both the Iraqi and Afghan projects “emphasized the need for real time communication between all parts of the team,” Forrester points out. “With the collaborative capabilities of Primavera we could record all changes and manage them. And it gave us documentation we could rely on. We had the planning, execution,

audits, business practices – everything – 100 percent absolutely properly documented.”

Scheduling and documentation were also important because of the

number of local contractors and subcontractors used on all the projects – Perini did about one-fourth of the work itself and gave as much as possible to local subcontractors. “We wanted to stimulate the local economies as much as possible – to kick start them,” Forrester says.

At one point, some 1,500 Afghans were working at Pol-E-Charki.

POWER TO THE PEOPLE

Fast-track projects have the benefit of fast results. Some of the Afghan bases are already housing as many as 6,000 soldiers, each helping to support and ensure a stable army. And according to the Ministry of Electricity, by last October total generating capacity in Iraq was up to 5,000 MW or more, with power available from 16 to 22 hours a day throughout the country – a major change from the three hours of service prevalent before the war.

“You have to have power before you can begin to rebuild a country,” Forrester says. “So the Iraqi electricity program was essential to the country’s recovery. Power is one of the first things peo-

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ple notice. It has an immediate impact,” he says, adding, “and it’s a good indicator that renewal is succeeding.” •

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