

Features



ADAM LUBROTH/LIAISON INTERNATIONAL

Lessons learned at Tengiz extend well beyond the oil patch.

Bright Lights, Big City

A new light-rail transit system will ease the heavy burden often borne by travelers using New York City's JFK International.

Dreamtime Down Under

Bechtel sets new standards for productivity at the world's largest zinc and lead mining operation, in northwest Queensland.

Beacon on the Horizon

The revamp of Kazakhstan's vast Tengiz oil field is producing much more than hydrocarbons.

Whirlwind Tour

From Berlin to Biarritz, Bechtel is racing to complete a series of fiber-optic rings by year-end.



Talent and technology shorten schedules and close distances in the Australian outback.

DEPARTMENTS

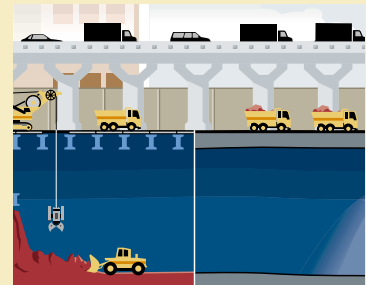
FRONT END

Hope for refugees, a U.S. football Hall of Famer, and solar-powered environmental cleanup.

MILESTONES

Keeping up with Bechtel projects and people on job sites and in offices worldwide.

DETAIL DESIGN



Tunneling in tight quarters Boston-style on the most complex U.S. highway project ever.

LIFE'S WORK

Jack Sheehan helped provide much-needed wintertime heat to a school in Kulsary, Kazakhstan.

©XPLANE

JOHN CRAWFORD/LIAISON INTERNATIONAL

Bechtel is ringing Western Europe with fiber-optic cable, and doing it in a hurry.

WHIRLWIND Tour

THIS IS the itinerary: link 1,850 kilometers of fiber-optic cable between 11 cities in Belgium, France, the Netherlands, and the United Kingdom, crossing the English Channel and the North Sea. All in less than nine months.

They said it couldn't be done. "Anything can be accomplished if you have the right team, focused on the right issues," responds Bechtel Program Manager Bill West. "And what a team ours turned out to be!"

Viatel's Circe Pan-European Network is a state-of-the-art broadband network capable of supporting voice, advanced data services, e-commerce, and multimedia applications. The network will eventually comprise multiple rings of fiber-optic cable covering 8,700

BY **SYBIL E. HATCH** ILLUSTRATION BY **STUART BRADFORD**

PROJECT PROFILE



LOCATION

Western Europe

CUSTOMER

Viatel, Inc.

PARTICIPANTS

Bechtel Telecommunications

DESCRIPTION

State-of-the-art, fiber-optic telecommunications system

SCOPE OF WORK

Program management, engineering, procurement, and construction management

VALUE

\$800 million (\$400 million Bechtel scope)

SCHEDULE

Completion by year-end 1999

route-kilometers and linking more than 42 major cities in Belgium, France, Germany, the Netherlands, Switzerland, and the United Kingdom.

“Bechtel got the first ring on-line in a hurry, brushing aside a series of setbacks and surprises with creative engineering, quick thinking, and plain old persistence,” says George Baber, general manager of Bechtel’s European telecommunications unit. Viatel awarded Bechtel the contract to build Ring One on March 13, 1998. Bechtel broke ground in July 1998. On March 15, 1999, Viatel put Ring One into operation.

In between, Bechtel crews took a whirlwind tour of Western Europe:

ENGLAND

London’s prolific gardens and majestic cathedrals hide a web-like labyrinth of buried utilities and other underground structures. Bechtel carefully placed cable alignments along secondary roadways to avoid historical structures. Despite meticulous research and planning, construction crews still had to work around several undocumented active and abandoned water and power lines, and break through old concrete building foundations.

Bechtel crews trenching near Lowestoft, England’s easternmost town, unearthed the foundations of an ancient Roman fort. Bechtel field-adjusted the cable alignment to the opposite end of the site to avoid disturbing artifacts and to get on with the work.

THE NORTH SEA

To meet the extremely aggressive Ring One construction schedule, Bechtel team member Alcatel Submarine Networks braved the raging North Sea in winter—not once, but twice—to lay submarine cable crossings.

Alcatel burned out two of its ship’s thrusters trying to stabilize the vessel against immense North Sea swells, while a remotely piloted underwater plow buried cable a meter deep in the sea floor. The cable-laying barge exerted 6 metric tons of pressure on the towline pulling the plow.

THE LOW COUNTRIES

Zandvoort is situated beside a long stretch of North Sea beach. Thousands of land mines were buried here during the world wars to discourage coastal invasion. Many remain. Before installing the Zandvoort beach chamber, a 27-metric-ton concrete box where the cable comes ashore,



local ordnance experts discovered and removed over a hundred land mines.

The historic Zandvoort railroad station houses the network regenerator site, where the laser signal is reconstituted after its journey across the North Sea. It's a fine example of brick-and-stone Victorian architecture. To meet local planning officials' concerns that building modifications be as unobtrusive as possible, Bechtel built a separate regenerator building below the railroad station, independently supported by piles, with its own concrete slab and walls.

The Netherlands and Belgium are called the Low Countries, for good reason. Amsterdam is built around a network of concentric and radial canals, crossed by about 400 bridges. Two-thirds of Belgium is flat, drained by the Meuse and Scheldt rivers.

Each river, stream, or canal crossing is an engineered design in which local conditions are studied, engineering recommendations made, and local authorities' approval sought. Bechtel engineers designed nearly 20 water crossings for Ring One alone. Fiber-optic cable was installed below waterways using directional drilling techniques.

FRANCE

To cross France, Bechtel relied on optioneering—exploring every possible design option and specifying several contingency plans and fallbacks. Crews placed cable in roadways. In canals. Along canal banks. In sewers. In subways. Along freeways. Under rivers. All told, Bechtel ran 503 kilometers of new fiber-optic cable in a long loop through northern France.

In Paris, Bechtel constructed two points of presence (where a fiber-optic mainline connects to local telecommunications networks), one

of them inconspicuously installed within a historic building near the Bastille. Bechtel engineers knew that the building needed strengthening to hold the equipment, so they specified a new steel floor designed to be supported by the existing structure. But when the time came, all the contractor found was a decayed timber frame, filled with rubble and coated with plaster. Bechtel quickly redesigned a new independent steel frame to be contained within the building's gutted interior, maintaining the distinctive exterior.

Ring One was only a prelude. Bechtel finished Ring Two in July 1999 and will complete Ring Three by year's end. Viatel appreciates the alacrity. "Bechtel did an outstanding job for us with the construction and engineering of Circe's first ring," says Michael J. Mahoney, Viatel's president and chief executive officer. "Their hard work and dedication has enabled Viatel to meet the very tight construction timetable we set for ourselves without sacrificing our extremely high standards for quality." 🏆

Bechtel Telecommunications



Over the past 30 years, Bechtel Telecommunications has completed more than 80 world-class telecommunications infrastructure projects worldwide. Bechtel's telecommunications group was formed in 1969 to support major Bechtel construction projects and has since developed into a market leader. Today, Bechtel Telecommunications provides design, engineering applications, project management, and construction management services for all types of innovative telecommunications systems, including fiber-optic and cellular system installations.

When it comes to getting a telecommunications system up and running, each additional 24 hours means a revenue opportunity lost and another day of exposed capital. With decades of experience in meeting and beating deadlines, Bechtel Telecommunications has a reputation for completing telecommunications projects on time or ahead of schedule. Accomplishments include expanding phone service across 2.1 million square kilometers of Saudi Arabia for the Kingdom's TEP 6 project, erecting 800 PCS installations across the United States for USWest, and installing 80,000 phone lines in and around Manila for Globe Telecom.

According to George Conniff, president of Bechtel Telecommunications, "Building strategic alliances with suppliers and subcontractors, mobilizing quickly, taking advantage of every opportunity to reduce critical path items, and bringing talented resources to bear on all our projects allows us to provide the absolute best service to our telecommunications clients."