

Editorial



**OSMOS  
In Belgium**

*Bernard Hodac, CEO of the OSMOS Group*

A young and dynamic company in Gand has just become OSMOS' spearhead in the Belgian market.

STAMOTEC is specialized in the reinforcement and rehabilitation of old structures, and most notably those belonging to a historical heritage. The company has extensive experience in all areas of stone pathology, and plans to make OSMOS technology a central axis of its development.

OSMOS has become a proved technology in the railway field.

Three quite varied applications are presented on pages 2 and 3.

**The Viaduct of Millau**

**OSMOS-licensed fiber optics on the largest cable-stayed bridge in the world**

**2km 46 long and 343 m high, the Viaduct of Millau, on the A75 motorway, will cross the Tarn Valley to connect Clermond-Ferrand to Béziers and Montpellier. At present it is the largest bridge construction site, and upon its completion will be the highest cable-stayed bridge in the world.**

One of its piles is already equipped with OSMOS-licensed fiber optic sensors. At present a survey is being conducted to study the possible application of OSMOS technology during the operational phase.



Le Viaduc de Millau

Front page news

**Howard Hansen Dam**

**OSMOS monitors blasting works**



**Howard Hansen Dam - Fish Passage Facility:**

This project involves constructing a cofferdam in the south abutment of the Howard Hansen Dam located east of Cumberland in Washington State, USA.

The cofferdam will be excavated by drill-and-blast with blasting in close proximity (2m +) to the existing intake structure. OSMOS' affiliate in Seattle, **Subterra Inc.**, will install instrumentation around the construction site to measure piezometric pressures, rock displacements in the cut face, and dynamic response of the intake structure.

Blasting seismographs, used to measure Peak Particle Velocity, will be complimented by OSMOS structure monitoring instrumentation that will be deployed to measure dynamic strains in the structures and dynamic displacements across construction joints.



Cumberland

Construction is expected to be carried out intermittently, to coincide with low water elevations, over a two year period.

Such challenges are yet one more reason for OSMOS monitoring.

# Railway Viaduct at Serrières

## Optimized Safety and Maintenance

*The Viaduct of Serrières is a large railway structure dating from 1864. In the course of a century, traffic has more than tripled. Certain signs of weakening have appeared, inciting the SNCF (the French railway company) to place the structure under preventive monitoring.*

Given that a sizeable number of conventional gauges previously installed had given only inconsistent and difficult-to-interpret information, the SNCF called on OSMOS to monitor the structure in its most critical section.

For the monitoring of overall stability, 7 7-meter optical strands were installed on the tympanum. For dynamic monitoring of train passings, two groups of 3 optical strands were placed on the intrados of one of the most representative arches, one group underneath each rail line.

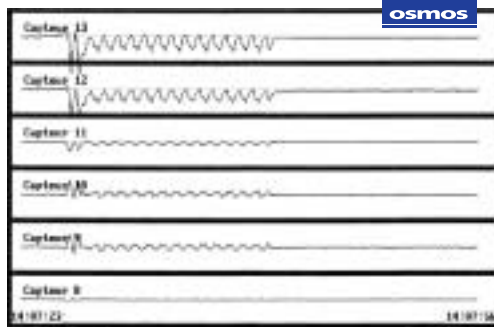
Measurements taken from 1994 to the present show that the viaduct is generally well preserved, in spite of a few local weaknesses. These weaknesses were dealt with through targeted reinforcement following a two-year observation phase. During this phase, OSMOS monitoring ensured the structure's availability in safe conditions, as well as the optimization of the repair program.



Installation of the optical strands, June 1994



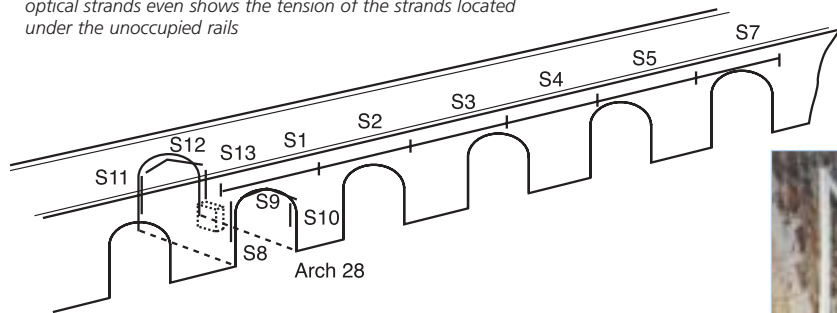
7 meter optical strand on the tympanum



Dynamic deformation of optical strands 8 through 13 at the moment of a train passing. The clean signal delivered by the optical strands even shows the tension of the strands located under the unoccupied rails



Installation of optical strands 8, 9, 10, and 11, 12 13 on the intrados of arch 28



Position of the optical strands on the Viaduct of Serrières



Measurements taken by one of the optical strands on the tympanum over a period of 10 years. The first 2 years of observation stand out clearly from the following years, due to the placement of steel arches and shotcrete on arch 28



Optical strands on the tympanum over a length of 50 m



# Yurakucho

## JGC determines the structure's behaviour before repairs



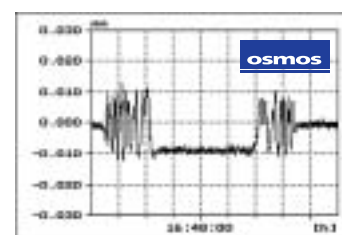
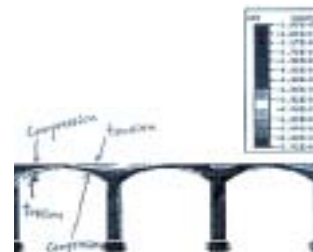
Yurakucho Station, Tokyo

*Yurakucho is a brick railway structure managed by Japan Railways. The stresses it undergoes are from earthquakes and vibrations due to intense railway traffic.*

JGC, OSMOS partner in Japan, has installed on the structure 4 2-meter optical strands on the basis of a previously established finite element modelization.



Optical strand under one of the rail lines, prior to installation of protective housing



Dynamic signature characteristic of a train's arrival, station stop and departure: a perfect elastic return



# Deutsche Bahn - railway section of Lohsa

TÜV-OSMOS will ensure safety through 2008

*The management of Deutsche Bahn in Dresden has planned an extension of the Horka-Falkenberg line for 2008. However, the path chosen for this double-track line presents a certain problem.*

The line was built in the 1950s in mining country. Since the mining operations were abandoned in the 1990s, the level of the water table has risen continuously, giving rise to fears of possibly significant local subsidences. This concern led the operator to reduce the operating speed to 50 km/h.

Deutsche Bahn charged TÜV-OSMOS with the mission of monitoring the effectiveness of the reinforcement works, and at the same time, of guaranteeing safety of the line's use. TÜV-OSMOS installed 20 optical strands to monitor continuously a section of 800 meters, in order to detect the slightest modification in the behavior of the "Railway-bearing ground system" (see OSMOS sinkhole watcher, OSMOS News N°6).

Following the reinforcement works, the monitoring will continue. TÜV-OSMOS will record the history of the static and dynamic deformations of the section through 2008.



Optical strands positioned over a length of 800 m



Installation of protective housing on the optical link network



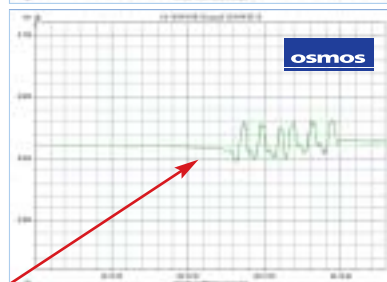
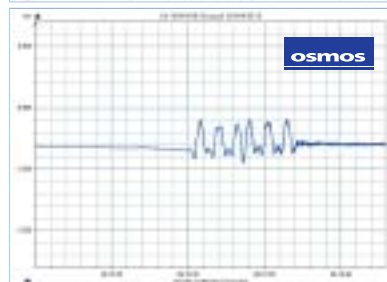
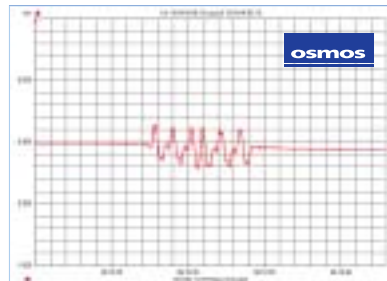
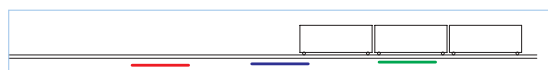
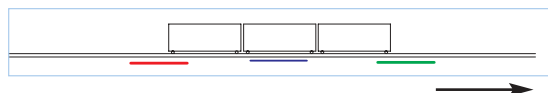
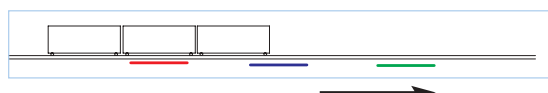
Optical strand on steel mounting plate, prior to installation of protective housing



One of the two monitoring stations at the site

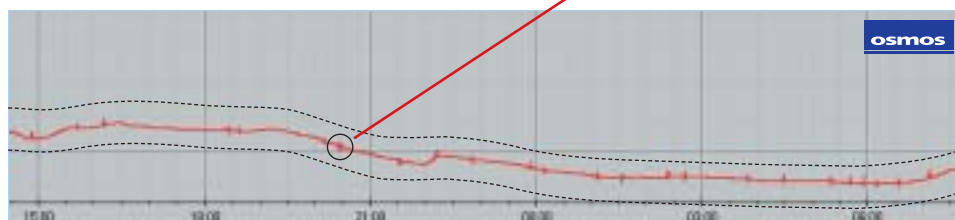


The optical link cables lead to the monitoring station



OSMOS sinkhole watcher over a length of 800 m overall view at the beginning of the monitoring

Dynamic signature of the same train passing over different optical strands



Every train documents the absence of sinking



# Alerts via SMS

## An OSMOS exclusivity

Dr. Jürgen Braunstein  
Production and  
Development Manager



*The OSMOS system automatically distinguishes between warning and alarm static thresholds, as well as the crossing of dynamic thresholds. Each user may freely configure every sensor's threshold.*

Whenever a pre-alert or alert level is reached, the information is sent according to the user's wishes: by fax, e-mail, SNMP-Trap, or...SMS.

This is carried out by the monitoring station station itself, and not by the Internet server.

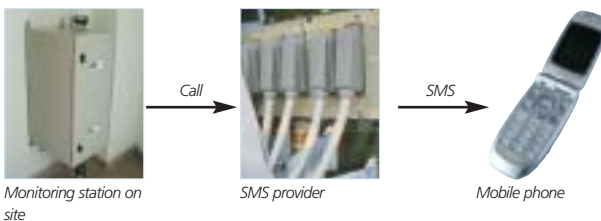
The information is composed of the key elements of the site monitored:

- the time the alert was sent,
- the type of threshold crossing (dynamic or static),
- abbreviated site name,
- the time the threshold was crossed,
- designation of the sensor (from the Installation Report),
- value reached at the threshold crossing.

The monitoring station is connected to an SMS provider or to an e-mail provider. Management of alerts via SMS offers the site manager the advantage of being informed in real time, wherever he or she is, in France or abroad, 7 days a week.

The monitoring station can handle simultaneously 5 SMS recipients. Entirely different threshold levels can be defined for each recipient.

Reception of threshold crossings via SMS does not necessarily need to be limited to alerts concerning an imminent risk. The user may also use the feature to compile information on his/her site's behavior, by adjusting the thresholds according to the information desired.



## New OSMOS Affiliates

### STAMOTEC

Visit the [Affiliates Area](#)  
www.osmos-group.com



Jo BLOMME  
General  
Director of  
STAMOTEC

Jo BLOMME was trained as both a structural engineer and a chemist. He is a recognized specialist in the restoration of listed historical buildings.

## USA

### OSMOS, Inc

12 East 49th Street, 24th Floor  
New York, NY 10017  
+1 (212) 974-88 30

Questions or comments?  
Please write us at:  
osmos-news@osmos-group.com  
www.osmos-group.com

## Affiliates

### Andreas Steiger & Partner AG

E-mail: mail@a-steiger-partner.ch  
www.a-steiger-partner.ch



### Basler & Hofmann

E-mail: pzwick@bhz.ch  
www.bhz.ch



### COPRA

E-mail: copra-osmos@wanadoo.fr  
www.copra-osmos.com



### I.P.C.

E-mail: ipc@ipc-ingenierie.fr  
www.ipc-ingenierie.fr



### JGC

E-mail: kado.masuo@jgc.co.jp  
jgc.co.jp



### MOMA

E-mail: info@momagroup.com  
Modélisation, Mesures et Applications



### Stamotec

E-mail: info@stamotec.be  
www.stamotec.be



### Subterra, Inc

E-mail: info@subterra.us  
www.subterra.us



### TÜV Rheinland Group

E-mail: bauwerksdiagnose@de.tuv.com  
www.tuv.com



### Urbitran

E-mail: narov@urbitran.com  
www.urbitran.com



## Coming soon

**OSMOS NEWS n° 11** will be devoted to the monitoring of historic structures and sites. Here are a few applications and themes that will be presented:



Participation of OSMOS in a symposium at Columbia University, NYC



Saint Lorenz Church, Lübeck



Church of Chécy



Château de La Roche-Guyon



Church of Notre Dame de Louviers