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WWW.OMEGA.MN

The OMEGA FO Monitoring Systems: a Russian Innovation for Technological and Ecological Safety

Dr. A. Turbin,
Deputy General Director
OMEGA Company

OMEGA Company, a OJSC Transneft Subsidiary

129515 Akademika Koroleva str. 6/1, Moscow, Russian Federation

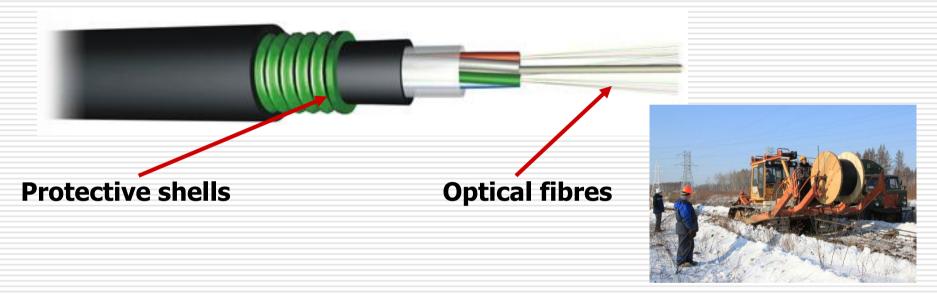
Tel: +7 499 7998435 Fax: +7 499 7998350 Web: <u>www.omega.mn</u>

E-mail: info@omega.mn, turbi60@mail.ru



OMETA

The OMEGA System Construction



Example of a design of a the fibre optic sensor for detection of environment fluctuations designed on the basis of a serial optical cable.

Ways of sensor installation: on surface, in water, in earth or on building constructions.

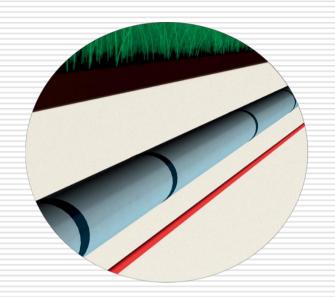
OMEGA System



- OMEGA FOPIACMS provides:
 - Monitoring of Temperature (DTS)
 - OMEGA system is employed by the OJSC *Tatneft* in heavy oil production and steam injection into the well since 2006.
 - OMEGA system monitors a series of Transneft pipelines. Baltic Pipeline (1000 km) commissioned in 2011.
 - Monitoring of Vibration and Acoustic (DVS)
 - OMEGA system monitors a series of Transneft pipelines. Baltic Pipeline (1000 km) commissioned in 2011.
 - Extended Object Strain Monitoring (DTSS)
 - At the trials in December 2010 the newly developed OMEGA Strains Monitoring Systems of Extended Objects (SMSEO) registered the 20-30 mm bending deformation of a 6 meter long 530 mm pipe.

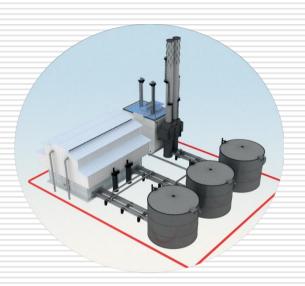
OMEGA Systems Application Fields

















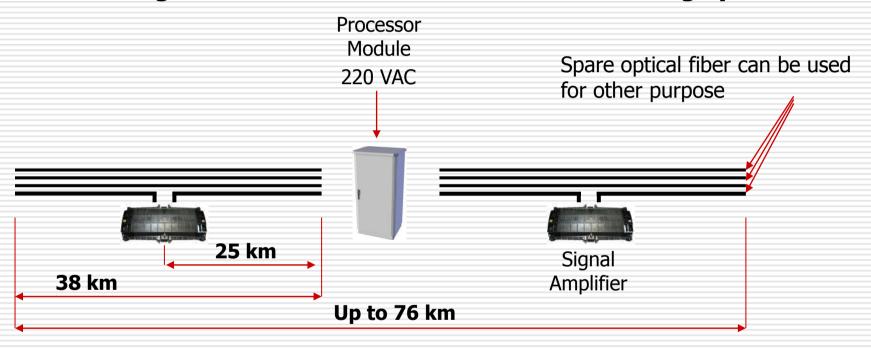
OMEGA DTS & DVS advantages are:

- Continuous on-line analysis of the pipeline condition and instant reaction to any events
- Event playback possibility
- High accuracy location of events
- Low false alarms
- High sensitivity of the system
- Simplicity of system installation



DTS System Configuration

Configuration of one DTS unit of the monitoring system



OMEGA DVS



- Coherent Optical Time Domain Reflectometry (COTDR)
 Principle
- Monitors the vibrations and third party interference along the pipeline with a resolution of 5 meters.
- The information is processed to classify different activities around the pipe, a.o.:
 - Digging
 - Mechanical Excavation
 - Human Activity
 - Vehicles Movement





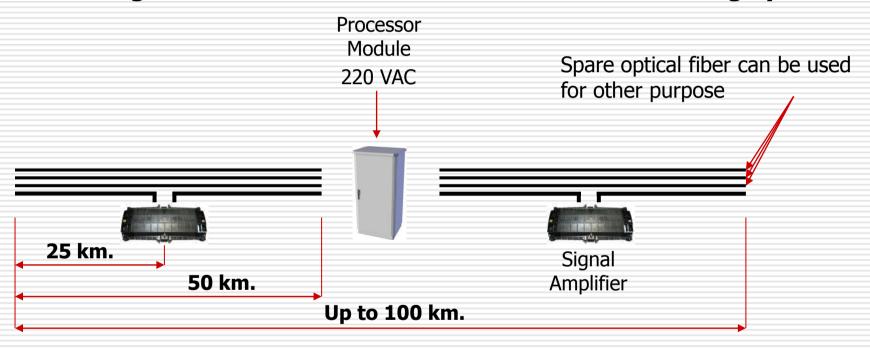






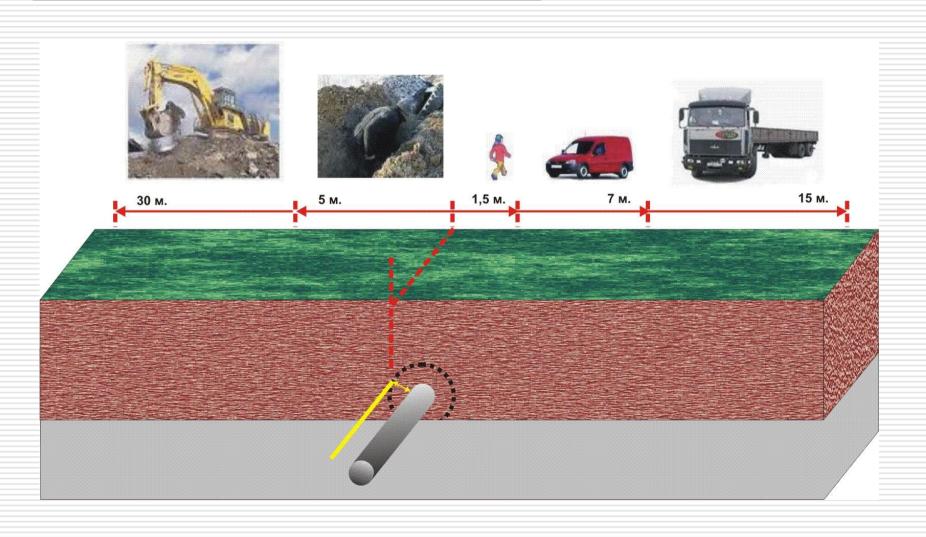
DVS System Configuration

Configuration of a unit of the OMEGA DVS monitoring system





OMEGA DVS – Detection Range



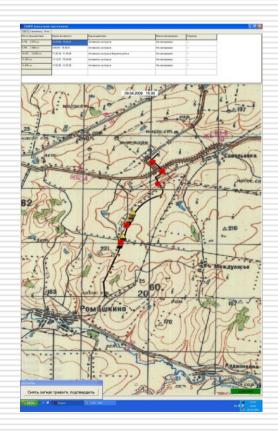


DVS Pipeline Monitoring



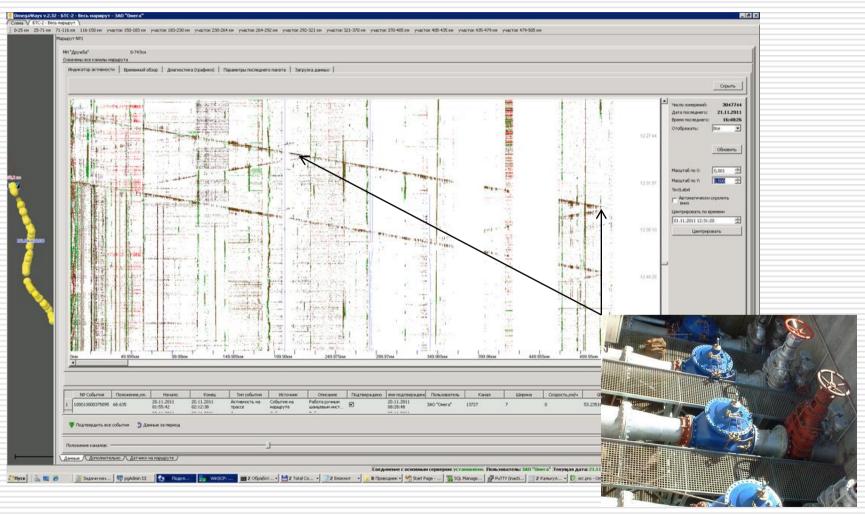
Classification of incidents to the Operator on a location map:

- Digging
- Mechanical Excavation
- Human Activity
- Vehicles Movement





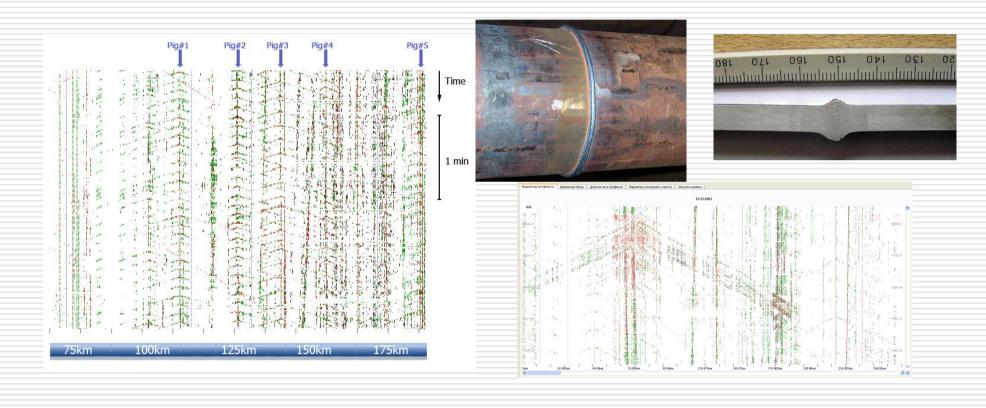
Intellectual System



The OMEGA system registers a Fluid Wave on BTS-2 near Smolensk, Russia, in November, 2011

The OMEGA Pig Detection Function

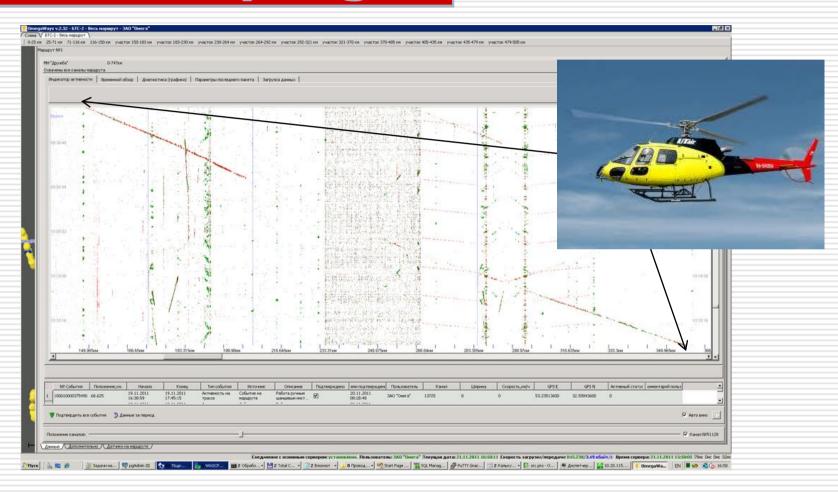




WHILE MOVING THROUGH THE PIPELINE THE PIG MEETS WELDED PIPE JOINTS. AT THESE JUNCTURES DISTURBANCES APPEAR PROPAGATING IN THE FORM OF PRESSURE WAVES IN BOTH DIRECTIONS AT A SPEED EQUAL TO THE SPEED OF SOUND IN THE LIQUID. IN THE CHART RECORDER EACH DISTURBANCE WAVE CREATES A Λ -FORMED IMAGE. THE TILT ANGLE IS DETERMINED BY THE WAVE SPEED IN THE PIPE (\sim 1050 M/SEC) WHILE THE LENGTH DEPENDS ON THE ATTENUATION AND THE SYSTEM ADJUSTED SENSITIVITY.

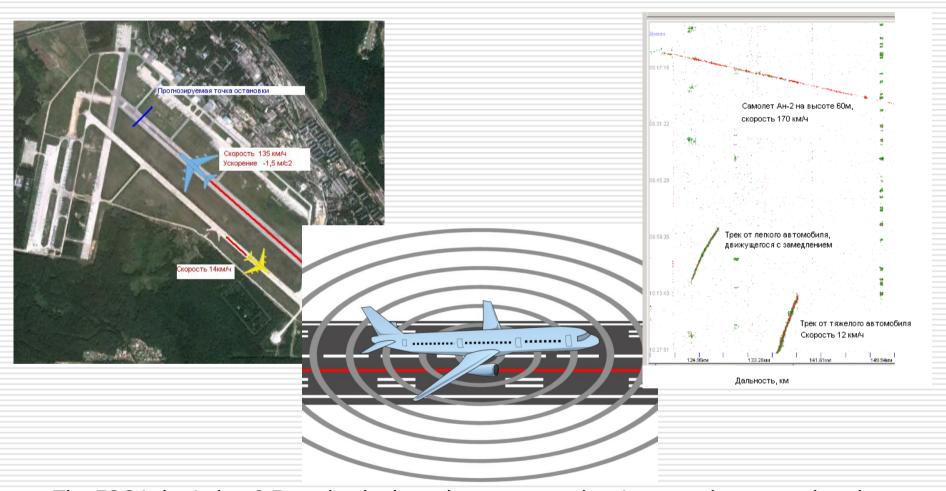


OMEGA: Fly High



A light helicopter identified by the OMEGA System flying along the BTS-2 Pipeline near Smolensk, November, 2011.

OMEGA: a Step Toward Aeroport Dispatching?

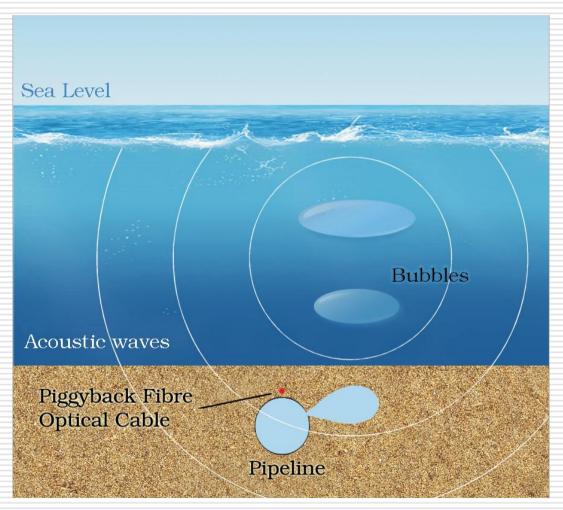


) OMEIA

The FOC is buried at 0,5 m. depth along the runway and taxiways and connected to the OMEGA DVS. During takeoff and landing aircrafts create vibration detected by the OMEGA sensor with an accuracy of 5m.



Gas Leak Detection



The OMEGA underwater Pipeline Leak Detection option is partially based on a special algorithm which detects gas bubbles in water





OMEGA DTS & DVS IS INSTALLED IN MAJOR TRANSNEFT PIPELINE PROJECTS:





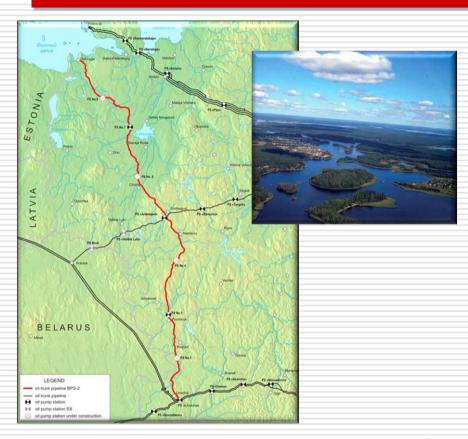
THE PUR-PE - SAMOTLOR PIPELINE SYSTEM (429 KM)

TRANSPORTATION OF CRUDE OIL FROM THE FIELDS IN YAMALO-NENTS AUTONOMOUS DISTRICT AND THE NORTHERN PART OF THE KRASNOYARSK REGION.

COMMISSIONED IN 2011

OMEGA Reference - 2







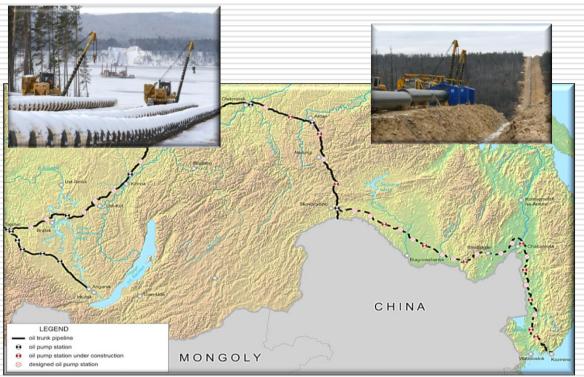
THE BALTIC PIPELINE SYSTEM - 2 (1000 KM)

A TRUNK PIPELINE WITH TOTAL LENGTH ABOUT 1000 KM, WITH CAPACITY OF 38 MILLION TONS PER YEAR AND FIVE PUMP STATIONS. THE PIPELINE ROUTE RUNS FROM BRYANSK TO LENINGRAD REGIONS.

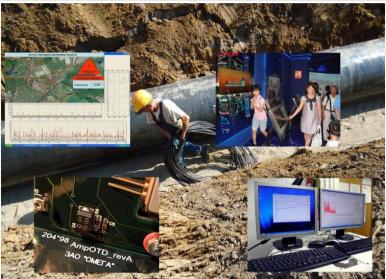
COMMISSIONED IN 2011

OMEGA Reference - 3





26th August, 2010 - Installation of OMEGA SMEO at ESPO-2 began.



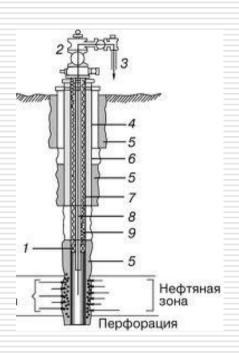
The East Siberia - Pacific Ocean (ESPO) Pipeline System (2046 km)

The second phase the East Siberia – Pacific Ocean pipeline system (ESPO-2) is currently under construction and is expected to be completed in 2013. It shall include a crude oil trunk pipeline from Skovorodino to the Kozmino SOSP with length 2,046 km.

OMEGA Reference - 4









PROJECT TITLE: Implementation of the "Omega" OISTP (Optical Indicator System of Temperature Perturbations) on production and injection wells.

CLIENT: JSC TATNEFT, Lenin St.75, Almetyevsk, Republic of Tatarstan, Russia The OMEGA Company has implemented the "Omega" OISTP (Optical Indicator System of Temperature Perturbations) on 12 oil wells of the "Nuratneft" Oil and Gas Producing Enterprise since 2005.

The OMEGA Company



The OMEGA Company created in 2009 is:

- Appr. 150 specialists in applied optics, electronics, programmers, construction professionals of different specializations;
- Scientific divisions conducting research according to the requirements of the clients;
- All patents and necessary permissions for construction works and maintenance of the OMEGA Systems obtained;
- More than 3800 km of "Transneft" pipelines equipped;
- A series of projects realized or in the phase of preparation.



The OMEGA Company International



The OMEGA Company on international markets:



Conducted presentations and dynamically developing business ties in almost 20 countries;

Successful participation in dozens of leading exhibitions, a.o. the Hanover Fair, significant specialized seminars in Dubai and Istanbul, the PSIG Annual Conference in Napa, the PPIM Houston and Prague conferences as far as the EXPO-2010 in Shanghai;



Since fall 2011 – participation in 7 tenders in strategic alliance with leading international companies;



Three Memorandums of Intent signed with the prospect of implementation of the OMEGA Leak Detection and Activity Control System in Europe and Asia.

Certificates





ГОСТ Р ИСО 9001-2008 (ISO 9001:2008)

Dun&Bradstreet (D&B) - DUNS 363531451

The "Omega" SMEO is protected by the Patent of the Russian Federation and possesses all necessary certificates and allowing documents. Транснефть

TUV certification is underway.