Pico Envirotec Inc., CA & ENVINET a.s., CZ

NEW APPROACH TO GLOBAL MONITORING OF THE RADIOLOGICAL SITUATION;
INDUSTRIAL, ENVIRONMENTAL & EMERGENCY

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Pico Envirotec Inc., CA

Pico Envirotec Inc. is a leader in design and manufacturing of turnkey Geophysical & Radiation Monitoring Instrumentation for precise magnetic and radiation measurements in the airborne and mobile/ground applications.

ENVINET a.s., CZ

ENVINET a.s. is an engineering and supply company providing complex Radiation Monitoring solutions and services for clients in the Czech Republic and abroad. Traditional supplier in the field of nuclear power engineering, laboratory technology, SW development, nuclear industrial automation and systems for ionizing radiation detection.
GLOBAL MONITORING
OF THE RADIOLOGICAL SITUATION
POTENTIAL THREATS

a) Nuclear Weapons (Current, Development, ...)
b) NPP and Nuclear Technology
c) Industrial Technology with Radioactive Sources Applications, Irradiators, ...
d) Medicine (Diagnostic, Nuclear Med., etc.)
e) Military (Weapons, Power, Control Systems)
f) Transportation of Radiation Materials
g) Illegal Trade with Nuclear & Radioactive Materials
h) International Terrorism
i) Others (Lost/Uncontrolled of RA Sources, ...)
RADIATION MONITORING NETWORKS

Monitoring Networks

- New Concept of RM Station
- Wide Dose Rate Range from 10nSv/h up to 10Sv/h
- Combination of Intelligent Spectroscopy and GM Probes
- Stand-Alone/Deployable RM Stations
- Heterogeneous Networks
- Air Samplers as a Component
- Network Connectivity and Long-Term Internal Memory
- Powerful Central SW
- Excellent Battery Capacity and Solar Charging System
- Rugged Design for Extreme Weather Condition ...
GLOBAL MONITORING OF THE RAD ... 
RADIATION MONITORING NETWORKS

New Components ...

- Air Samplers with Gamma Spectroscopy Module and Remote Controlled Function
- Monitoring Gates (Borders, Traffic Control, Railroads, ...)
- Sophisticated Meteorological Modules
- New Powerful SW Application for All Used Platforms
- Supporting Chemical Sensors (Air Pollution Control)
- Stable and Temporary Network Components
- Airborne and Mobile Units/Teams
- Water Monitoring Stations ...
IMS SW MONRAS

- Three layer architecture within web based client
- Unlimited number of clients
- Graphical interface & Data export
- Operating system independent software (both clients and servers)
- User access rights & Support up to unlimited number of measure stations
- Station data processing/control
- Modifying station parameters via graphical interface
- Presents measured data in various forms: table, map, chart
- Alarms (SMS, e-mail) and logs
- Web services for third party systems integration
- EURDEP data interface, ...
• Monitoring of large territory areas,
• Monitoring of industrial and urban agglomerations,
• Identification of RA contamination by using of gamma spectroscopy,
• Localization of unknown RA sources,
• Identification & estimation of radioactive sources activity from air,
• Non-Standard monitoring (water sources, check points, transport of RA material, ...)
• Simulation of real situations of contamination, real training ...
GLOBAL MONITORING OF THE RADIOLOGICAL SITUATION

AIRBORNE MONITORING

DATA Transfer

Pilot Navigation Unit (PGU)
- Info for pilot: Survey polygon, Flight lines, Current Location, Ground Speed, Altitude, ...

Sensors
- Measurement of Pressure, Temperature & Humidity

GeoImage
- Stand-alone digital (1024x768) imaging system

IRIS
- Airborne Gamma Spectroscopy System
- 16/32L of NaI(Tl) Detectors, DSP/FPGA Spectrometer, Real-Time Data Processing, Toughbook Control Unit, Certif. Boxes

GPS
- GPS Position (Lat, Lon)
- Date & Time (PPS, GGA, VTA & ZDA)

Radar or Laser Altimeter
- Altitude above ground, H (m)

Gamma Dose Rate (nGy/h)
- Recalculation to the std. level - 1m above ground

RM Concept!

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Airborne System IRIS

- High Sensitivity - Up to 32L of NaI(Tl) or 20 Spec. Detectors
- User Detector Configuration
- Fully Digital Signal Processing
- Self-Calibration & Auto Stabilization
- Real-Time Activity & Dose Rate Calculation
- Recalculation to the Ground Level
- All Data Synchronized with GPS Time and Position
- Precise GPS Navigation - Link to Radiation Measurements (Alarm)
- Real-Time Data Presentation
- Up to 20 user definable ROI's...
Mobile Monitoring

Relative simplicity and preparedness, one of the most monitoring methods in use.

Effective use in many operations – radioactive material transport, localization of uncontrolled sources, routine monitoring (RMS), military missions, homeland security tasks, ...

High efficiency in local monitoring, routes or survey in urban and industrial zones.

The measurements may be supplemented by portable systems and equipments.

Possibility of In-Situ radionuclide identification and specific sample taking.

Possible Data transmission, ...
IRIS Mobile

Intelligent, self-calibrating, gamma spectroscopy system with auto stabilizing on natural peaks

New Design for Configuration with different (type/shape/volume) Detectors

Precise GPS Module, New Auxiliary Sensors (Temp., Hum., Press., etc.)

Different Volume of SPEC/NON-SPEC Detectors - Defined by Application

Connectivity Ethernet or Bluetooth

Chaining of more Units based on Master/Slave Definition up to 20

Left/Right (Up/Down) Detector User Definition (Pb Separator), GM Module ...
GLOBAL MONITORING OF THE RADIOLOGICAL SITUATION
MONITORING VEHICLE

Unique Features
- High Sensitivity
- Plastic Detector Max. 4Litr.
- NaI Gamma Spectroscopy Module
- Hi Dose Rate GM Module
- L&R Ratio Measurement - Elimination BKG
- Gamma Spectroscopy NaI/Tl, BGO, LaBr ...

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**MONITORING VEHICLE**

<table>
<thead>
<tr>
<th>Std. Road</th>
<th>Field Road</th>
<th>Concrete Road</th>
<th>Radioactive Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Count</strong></td>
<td></td>
<td></td>
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<tr>
<td><strong>Dose rate</strong></td>
<td></td>
<td></td>
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<tr>
<td><strong>L/R Ratio</strong></td>
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</tbody>
</table>

**IRIS Mobile**

- Left & Right Detector Configuration
- With Lead (Pb) Shield

**Graphs**

- Data for Std. Road, Field Road, Concrete Road, and Radioactive Source
- Images of roads and radioactive source

**250g Thorium Oxide in distance 10m**

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Mobile RM Lab - NuLAB

Mobile RM Lab performs an unique function in RMS
Optionally VAN or ISO-Container Version
Powerful instrumentation and Equipment for Monitoring and Gamma SPC Analyse of Basic Samples
Installed Detection System for Mobile Monitoring with Gamma Spectroscopy and Dose Rate Measurement, Alpha & Beta Contamination Detection, Neutron Detection and other
Directional sensitivity of the Detection System
Hi-Performance HPGE Spectroscopy System with Pb-Shield and Standardized Detection Geometry
High Volume Air Sampler (New Product)
Independent Power System with Portable Generator, Hi-Capacity Battery, VDC Converter and Solar Panel
Portable Weather Station, etc.

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Self-Containing Autonomous Detection System for Mobile or Stationary Applications

Gamma Spectroscopy Performance of AGRS Spectrometer

0.1-1sec Spectra or Accumulation/Norm. Spec.

Internal Data Recording, Cycl.

Connectivity Ethernet or Wireless Bluetooth

Power 6-40VDC

„One Button“ Operation !!!

Auto Calibration (Start) and Real Time Stabilization

Up to 20 Slave Detectors on One Master Unit, etc.

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Global Monitoring of the Radiological Situation - Portable/In-Situ App

System PGIS-2

- Gamma Spectroscopy System with detector 0.3 - 4 Liter NaI/BGO
- Android based control device
- Easy operation (Smart Phone, Tablet, NB)
- Excellent graphic output
- Recording of Photos, Voice, Txt-Notes
- 2+1 GPS Devices options
- Receiving A-GPS & GLONAS
- GSM Data transmission (SMS, Web Service)
- On-Lin OSM Map navigation
- Direct export to KMZ Google Earth format
- High battery capacity
- Rugged/Waterproof Case, ...
System PDOSE-3

Device for portable, mobile & standalone monitoring of radiation situation.
Measurement of Dose Equivalent Rate of gamma radiation
Real-time data synchronization with GPS position
Wireless communication via Bluetooth
Control unit – any device based on Android OS (Smart Phone, Tablet, NB, High performance software PEICore
Power from the onboard network or operation on internal battery
Rugged and powerful system
GLOBAL MONITORING OF THE RADIOLOGICAL SITUATION
PORTABLE/IN-SITU APP

Unique Features:
- Mob/Portable Applications
- Easy control by Android
- Black Box, Station & Survey Mode
- Real-Time data sending GSM
- Multimedia files taking
- Web App MobDOSE Monitor, ...

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Fully automated, highly integrated, light weight and self contained gamma-ray monitoring system

State-of-the-art PEI latest technology based on AGRS Spectrometer (Airborne)

Self stabilizing system on natural radioactive elements

Embedded sensitive GPS for positioning and precise synchronization 1PPS signal

Unique real-time recalculation of measured data to ground level by means of real flight altitude measurement, ...
Cruise operational endurance: 40 minutes
Hover operational endurance: 30 minutes
Up to 12kg of payload capacity
Customizable for new sensors
Fully autonomous flight
Vertical take-off and landing
Additional reserve for safety and
Battery longevity: 5 minutes
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R&D CONCEPT

Radiation Survey  Military Missions  Homeland Security  Environment Monitoring

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Thank You!