

LARGE AREA SURVEY MONITOR

The Large Area Survey Monitor (LASM) provides a method for rapid environmental / criticality control during soil and waste retrieval activities.

The LASM or “Dig Face Monitor” can be attached to a crane hoist, or other suitable device to position the instrument upon the dig face.

The neutron counting system is sensitive to a footprint area of 3 meters by 3 meters. The LASM is primarily designed to alert operators to potential radiological alarm conditions and is capable of detecting 200 grams or more of weapons grade plutonium equivalent material to a depth of 1 meter (3 feet) in soil.



Features

- High sensitivity total neutron counting.
- Detection of highly penetrating neutrons allows sub-surface measurement up to 1 meter depth in soil.
- Gamma detector option (low resolution gamma spectroscopy) for detection of fission products and uranium.
- Environmentally sealed sturdy aluminum enclosure.
- Designed for ease of decontamination and rugged field applications.
- Quick set up time.
- Remote wireless communications between the Control PC and LASM unit at a distance of up to 400 meters.
- Completely self-contained with ³He detectors and processing electronics.
- Check-source / calibration stand.
- Custom software automatically performs all data-acquisition and analysis.
- Polyethylene background shielding minimizes cosmic ray interference and improves detection limit
- Provides 3D location of buried Pu sources.

Applications

- Plutonium contamination monitoring
- Environmental measurements
- “Go / No-Go” for criticality check in waste retrieval
- Verification of material-at-risk for personnel safety
- Fast and efficient site clean up
- Pre-characterization of buried waste containers
- TRU monitoring in accident scenarios

Benefits

- Locates plutonium / TRU “hot-spots” at burial sites.
- Material-at-risk limits are confirmed, prior to excavation, by direct measurement.
- Ensures criticality safety during waste retrieval.
- Verifies environmental contamination at landfill sites are within regulatory limits.
- Remote data transfer minimizes exposure risks to personnel during retrieval operations.
- Fast wide-area monitoring of contaminated land for post-accident clean up scenarios.
- Rapid counting and high sensitivity provides a quick and reliable Pu survey to support on-site radiological characterization.

Specifications

Measurement technique:	Total neutron counting detects and quantifies neutrons emitted from buried plutonium. Optional low resolution gamma spectroscopy detects and quantifies buried uranium, gamma emitting fission products and corrects for (alpha,n) interference from fluorides.
Neutron Detectors:	16 ³ He detectors located in 4 modules
Software	Custom software controls acquisition and analysis / operator alarms
System Control:	Remote laptop or PC
Measurement Control Checks:	²⁵² Cf with check source stand provided
Background measurement:	Automated regular checks
Remote operation:	Wireless ethernet connection. The system has been implemented to operate reliably at a range of up to 400 meters.
Deployment :	Fork-lift or overhead crane. May be orientated horizontally, vertically or at any angled approach.
Data Inputs:	None required
Data Outputs:	Total Pu content. "Go/No-Go" operator alert. Optional fission product / uranium measurement
Gamma detector	Optional NaI or Geiger-Müller tube. A high resolution gamma spectroscopy pre-survey with high purity germanium (HPGe) detector is recommended where there is a significant probability of encountering variable isotopic distributions (e.g. Reactor Grade, Heat Source).

Performance

Assay Time:	Configurable count time from 5 - 15 minutes
Neutron footprint	3m x 3m
Depth sensitivity:	Up to 1 meter for dry soil (reduced for wet soil)
Maximum Pu Range:	200 g Pu
Applicable Matrix Types:	Soil / rubble / gravel / sand / tarmac / asphalt / concrete
Lower Limit of Detection:	<1 gram WG Pu for low moisture soil

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