Polaris-H

GENERAL DESCRIPTION:

Polaris-H was developed for nuclear power plants as a complete solution for the identification, quantification, and localization of gamma-ray sources. It is a battery-operated system that weighs less than 10 pounds, with an integrated optical camera to overlay the gamma-ray image for each isotope the system identifies. The energy resolution is near 1% FWHM at 662 keV, and the detector can localize gamma-ray sources in all directions simultaneously. It is ready to use within two minutes of pressing the power button. It is airtight and watertight for easy decontamination. A tablet connects wirelessly for real-time display of the spectrum and image some distance away. The detector technology is 3D-position-sensitive CdZnTe (CZT).

TECHNICAL DESCRIPTION:

The system is an imaging gamma spectrometer based on 3D-position-sensitive CdZnTe (CZT). This allow each gamma interaction to be located within the detector. This along with the energy measurement allows for the direction of the incoming photon to be calculated in real time. This information is displayed over a registered visual image to provide an energy selected view of the gamma emissions in the environment.

CONTACT INFORMATION

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COST

- ~$100,000/system
- N/A/analysis

Tier Selection

Final tier assignment is based on overall product score.

Top Tier Second Tier Third Tier Fourth Tier Bottom Tier

RANKINGS

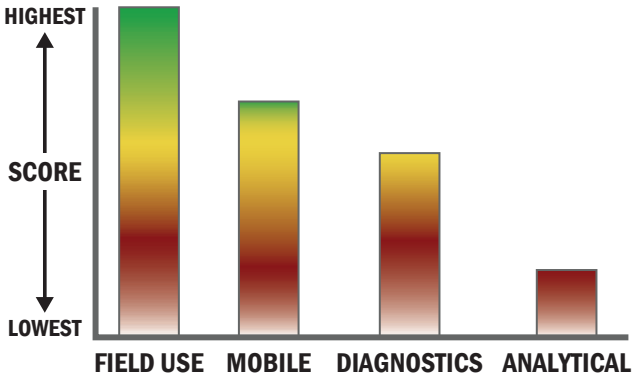
	Biological	Chemical	Radiological
FIELD USE System	N/A	N/A	Second Tier
MOBILE Laboratory	N/A	N/A	Top Tier
DIAGNOSTIC Laboratory	N/A	N/A	Top Tier
ANALYTICAL Laboratory	N/A	N/A	Second Tier

Survey Source

Open Source Information/Subject Matter Expert

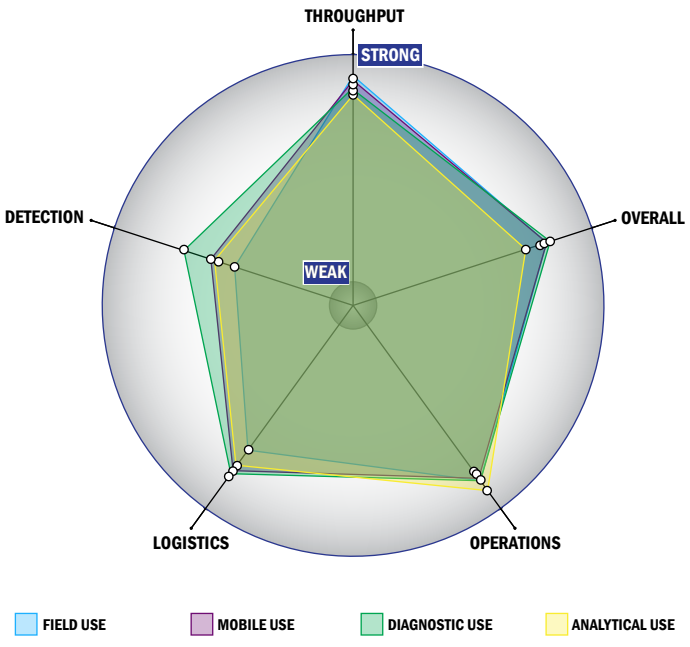
Scoring Analysis

System scores are compared across the four scenarios and ranked from highest to lowest.



Impact Chart

The Impact Chart is a spider graph representing specific categories and designed to give the reader a visual depiction of how a particular system is expected to operate across the four different scenarios. The score for each of the seven categories is presented as the percentage of the total possible score. Higher category scores extend the spokes of a graphic toward the outer edge of the chart. The area graphed for each of the four scenarios relates to how well the system performed in that scenario. Graphics for each of the four scenarios are super-imposed for ease of comparison.



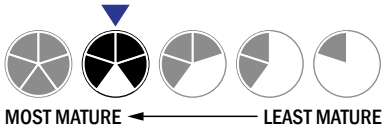
Evaluation Criteria

Throughput:

- Between 2 and 15 minutes for detection
- Multiple samples, multiple tests/ sample per run
- System is continuous and provides real time analysis with no defined tests/samples
- The system or device is currently semi-automated
- Device or system is intended for multiple detection assays
- 0-1 solutions, buffer, eluents, and/or reagents
- 0 components
- Less than 5 minutes is required for set-up
- 1-2 steps are required for detection

Logistics:

- An afternoon of training and some technical skills required
- Approximately the size of a toaster
- Between 1 and 5 kg
- Wireless and wired connections are available
- System or device uses batteries



Operations:

- Can be used from 4 °C to 41 °C
- This system does not require consumable components
- Performance is not influenced by relative humidity
- Greater than 10 years expected life
- Results can be viewed in real-time
- The system or device is currently fully autonomous
- The system software is closed and not available for modification
- The system hardware is closed and not available for modification

Detection:

- Not possible to achieve 510K clearance
- Possible the system could receive FDA approval
- This system does not test liquids and this question does not apply
- Superior specificity. System has a false alarm rate approaching zero (~0%)
- Total dose, dose rate and count rate with operator selection to show the display, may differentiate between types of radiation
- Down to background level radiation (i.e., gamma 1 µR/hr)
- Down to background level radiation, expressed in cpm or similar units
- System is used for surveying