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Radiation Detection, Monitoring, And Safety - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2024 - 2029)

https://marketpublishers.com/r/R90DFA8158ACEN.html
Date: July 2024
Pages: 142
Price: US$ 4,750.00 (Single User License)
ID: R90DFA8158ACEN

Abstracts

The Radiation Detection, Monitoring, And Safety Market size is estimated at USD 3.44 billion in 2024, and is expected to reach USD 4.44 billion by 2029, growing at a CAGR of 5.20% during the forecast period (2024-2029).

The increased stability of manufacturing industries will likely drive the market's growth during the forecast period. Using radiography testing in the manufacturing industry to test the quality of manufactured goods and inspect flaws is also likely to fuel the market.

Key Highlights

According to the World Nuclear Association Plans for New Reactors Worldwide, nuclear power capacity increased steadily, with about 50 power reactors under construction around the world. Most of the reactors are planned in Asia (in China, India, and South Korea, among others), with new units in Russia and the United Arab Emirates, while the existing capacity is being created by plant upgrading.

According to the World Energy Outlook (WEO) report, its Stated Policies Scenario' witnesses installed nuclear capacity growth of over 15% from 2019 to 2040, about 480 GWe. The scenario predicts a total generating capacity of 13,418 GWe by 2040, concentrated heavily in Asia, particularly India and China. The contribution of nuclear to global power generation is expected to reach about 8.5% by 2040.

Plant lifetime extension programs maintain capacity, particularly in the United States. Almost all the power reactors in the United States can potentially be licensed to operate for 60 years, with owners undertaking significant capital works to upgrade them at

around 30-40 years. The license renewal process typically costs USD 16-25 million, and the procedures for such renewals, with public meetings and complete safety reviews, are exhaustive.

In March 2000, the Nuclear Regulatory Commission (NRC) renewed the two-unit Calvert Cliffs nuclear power plant's operating licenses for an additional 20 years. The NRC is considering applications for extending operating licenses beyond 60 out to 80 years with its subsequent license renewal (SLR) program. During the second wave of the COVID-19 pandemic, reactors approved for 80-year licenses were Turkey Point 3&4, Peach Bottom 2&3, and Surry 1&2 in the United States. Therefore, plant lifetime extensions by various countries are expected to boost the market's growth during the forecast period.

The strict regulations provided by regulatory bodies are expected to affect product approvals and compliances and private body-led monitoring, thereby hampering the market's growth.

According to the National Bureau of Statistics of China, in 2023, China's industrial production increased by about 4.6% compared to the previous year. According to the Department for Promotion of Industry and Internal Trade (India), the manufacturing industry appears to be a fast-growing sector owing to the rapidly growing population in India. Factors like these are expected to create more opportunities in the market in the coming years.

Radiation Detection, Monitoring, And Safety Market Trends

Medical and Healthcare Industry to be the Largest End User

The medical and healthcare industry accounts for major market shares due to the increasing adoption of dosimeters and detectors in radiology, emergency care, dentistry, nuclear medicine, and therapy applications. Several forms of radiation are being used in medical diagnostics and treatment. However, all forms are potentially dangerous, and exposure must be carefully controlled to ensure that the benefit to patients outweighs the risks from exposure.

According to the Society for Radiological Protection, naturally occurring background radiation is the primary source of exposure for most people, contributing about 88% of the annual dose to the population, while medical procedures contribute most of the remaining 12%.

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Additionally, the increasing number of nuclear power facilities worldwide is increasing the demand for radiation monitoring equipment. Byproducts of these power plants can be used in the healthcare industry. Incidentally, hospitals have been promoting the installation of diagnostic radiology equipment accompanied by medical isotopes administered to patients.

The increasing investments in cancer therapy within the regions witnessing an increase in diagnosed patients are further expected to increase the demand for radiation therapy and medical devices. According to the American Cancer Society, over 18 million Americans were reported to have cancer in the year 2022. It is estimated that over 2 million new cancer cases are predicted to be diagnosed in the United States in 2024. The data provided in the graph shows that the radiation therapy segment is among the major categories. Therefore, increasing cancer treatment cases may create an opportunity for the market vendors.

According to Canadian Cancer Society data revised in November 2022, about 233,900 people were living with cancer in Canada in 2022. The Globocan estimates that globally, there will be more than 30 million individuals living with cancer by the year 2040. Thus, the high burden of cancer worldwide is expected to propel the market's growth in the coming years.

Asia-Pacific to Witness Major Growth

Asia-Pacific is expected to witness significant growth in the global market in terms of revenue, owing to the rising focus on nuclear power for electricity generation to meet the growing energy demands and rising stringent regulation for human and environmental safety among the emerging countries, such as China, India, and Japan.

For instance, according to Exxon Mobil, it is anticipated that in 2040, the nuclear energy demand in Asia-Pacific will amount to approximately 22 quadrillion BTUs. That year, the world's nuclear energy demand is expected to account for 45 quadrillion BTUs.

According to EIA, there are 55 operable nuclear power reactors in China as of May 2023. According to the National Bureau of Statistics of China, in January and February 2024, the electricity output from nuclear power plants was 69 terawatt-hours. That year, the monthly nuclear electricity production fluctuated between 30 and 40 terawatt-hours

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in the country.

Radiation detection, monitoring, and safety are crucial in the manufacturing sector's non-destructive testing (NDT) processes. NDT techniques like radiography, gamma-ray scanning, and neutron radiography rely on radiation to inspect materials and components without causing damage.

One of the primary factors fueling the region's demand for radiation detection, monitoring, and safety is its rapidly advancing healthcare infrastructure. As India continues to invest in modernizing its medical facilities, there is a growing emphasis on incorporating advanced diagnostic and imaging technologies.

Radiation Detection, Monitoring, And Safety Industry Overview

The radiation detection, monitoring, and safety market is fragmented. Companies are investing in upcoming technological advancements to increase their portfolio. Several startups are innovating with drones and mini-planes, providing equal competition to the existing players. The companies Arktis Radiation Detectors Ltd, Amray Group Limited, Burlington Medical LLC, Centronic Ltd, and Teledyne FLIR Systems INC leverage strategic collaborative initiatives to increase their market share and profitability.

In December 2023, a contract was signed to seal the exclusive partnership between Thermo Fisher Scientific and RDC to offer NetDose, a digital dosimeter, to North American customers in the healthcare, dental, and veterinary fields. The digital technology of NetDose allows radiation to be monitored with Bluetooth technology and eliminates the need for reshipments from dosimeters every time they are processed in a laboratory.

In December 2023, Radiation Detection Company (RDC), a dosimetry service company focused on making radiation safety in the healthcare, veterinary, dental, and industrial fields affordable, reliable, and easy to use, signed an agreement with Thermo Fisher Scientific to distribute and service Thermo Fisher Scientific’s digital dosimetry solution, NetDose.

Additional Benefits:

The market estimate (ME) sheet in Excel format

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