NDT in Power Generation - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2025 - 2030)

Market Report | 2025-04-28 | 120 pages | Mordor Intelligence

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Report description:

The NDT in Power Generation Market is expected to register a CAGR of 6.31% during the forecast period.

Key Highlights
- The power generation industry has undergone various changes, including enhanced overall efficiency and quality of the materials used. Exposure to operating and environmental conditions can cause damages to unforeseen. NDT serves that purpose to check any such flaws and help solve the problem before it elevates.
- The main scope of NDT applications in the power industry is to help ensure plant equipment's safety, integrity, and reliability, such as pressure vessels, boilers, heat exchangers, pipework, and pipelines. The inspection of concrete structures is a part of plant life assessment, as these materials often form an essential part of constructing such plant equipment.
- North America has been the flag bearer for the NDT equipment market in the power generation sector and still has opportunities for advanced NDT applications. Recently, Asia-Pacific has experienced an enormous boom in power demand, mainly from China, India, Japan, and South Korea. This shift has created significant market opportunities for companies providing equipment and services in the NDT market for electricity generation. Due to emerging eco-friendly natural gas power plants, the demand for NDT equipment is expected to be higher in the APAC region.
- Further, the increasing utilization and adaptability of digital imaging technology are also expected to increase the cost-effectiveness of the NDT equipment methods in the power generation industry. Continuous data collection, storage, online inspection, advanced simulation of data in real-time, and interpretation of the information are also possible with new NDT equipment techniques. These techniques are creating greater opportunities in the market.
- Moreover, various regulations make it mandatory for power plants to undergo a life assessment procedure as a safety measure. Apart from this, inspection is also required to check for any damages to the equipment and take necessary countermeasures to control them. This situation is expected to create increased opportunities in the nuclear power sector.

- Several governmental agencies and regional bodies, like the American Society of Mechanical Engineers (ASME) and the International Organization for Standardization (ISO), have been instructed to formulate stringent measures for assuring the safety of instruments, while overseeing the process of engineering services testing. This is crucial for gaining clearances and certificates from the concerned authorities thereby creating a positive impact on the NDT market.

Non-Destructive Testing In Power Generation Market Trends

Visual Inspection Testing is Expected to Witness a Significant Growth

- Visual inspection equipment comprises a wide range of endoscopes, high-speed cameras, thermal imagers, and microscopes, which are used to detect leaks or cracks on the surface of the specimen. These are also used for quality assurance or maintenance and repair in the power generation industry. Visual inspections are carried out during series production or in the final inspection step.
- Also, visual inspection equipment comprises devices used for two different types of inspection, direct and indirect inspections. Direct equipment is employed to test and assess the material directly by one inspector or tester.
- Direct visual inspection can be carried out with tools such as borescopes, fiberscopes, and HD optics. These are used in difficult-to-reach places, such as the insides of machines, locks, etc. In indirect visual inspection, the area to be inspected is captured by a camera and displayed on a monitor by many people.
- Due to the advancement in technology and digitalization of the power generation sector, companies are innovating automated visual inspection equipment. For instance, RNA has manufactured a computerized vision inspection system to meet high-speed quality control requirements for 100% inspection. It can be used for system integrators, sorting, production, manufacturing, and all types of automation and robotic applications in various industries, including the power generation sector.
- Further, many companies offer remote visual inspection equipment in the studied market. For instance, Baker Hughes offers a range of durable remote visual inspection equipment that enable easier and more accurate data collection and analysis. The company uses technologies such as Real3D to ensure measurement accuracy, and TrueSight, for superior image quality. Its visual inspection equipment is built to meet the modern demands for safety, efficiency, and precision in the power generation industries.

Asia Pacific is Expected to Witness Significant Growth

- Currently, China is the world's largest producer of electricity. The country's energy demand is expected to increase, thereby provoking the growth in energy production. NDT application in the fossil fuel segment for power generation dominates the market. Also, there has been an increased count of aging infrastructure in the power industry in the country, making it essential to use NDT equipment to identify and secure the integrity of these structures. As a result, the NDT service in the country is expected to grow rapidly over the forecast period.
- In February 2021, China put a new 38.4 gigawatts (GW) of new coal-fired power capacity into operation. Also, China supported the construction of a further 36.9 GW of coal-fired capacity in 2020, three times more than in 2019. It now has 247 GW of coal power under development, enough to supply the whole of Germany. The NDT equipment market is expected to have tremendous opportunities with these planned power plants.
- India has the fifth-largest power generation capacity globally. Also, the country ranks third globally in terms of electricity production. The Indian national electric grid has an installed capacity of 382.15 GW as of March 2021. This implies that the current demand for NDT equipment is dominated by the fossil fuel sector, with nuclear energy-based NDT equipment slowly gaining momentum.

- Further, South Korea had more than 84 coal power plants (CPP), 27 gas power plants (GPP), and 23 nuclear power plants (NPP) operational at the end of 2016. According to several studies, the electricity demand increased approximately 0.7% Y-o-Y in the country, leading to 4 NPP, 8 CPP under construction, and 6 more CPP announced for the future, creating several opportunities for the NDT equipment market in the region.
- According to the Japan Atomic Industrial Forum, twelve other reactors at six sites have been approved for the restart, and two new powerplants are under construction, which is expected to be operational in the forecast period, increasing the need for NDT services in the power generation sector.

Non-Destructive Testing In Power Generation Industry Overview

Non-Destructive Testing (NDT) in Power Generation Market is competitive in nature and consists of several key players. The increasing regulations, which make it mandatory for different organizations to undergo a life assessment procedure as a safety measure, coupled with the regular inspection required to check for any damage in the equipment, create a market for NDT in the power generation industry. Key players in this market are introducing new innovative products and forming partnerships and collaborations to gain competitive advantages.

- February 2021 - Controle Mesure Systemes developed software called Probus. It collects information provided by NDT equipment to display signals, analyzes them, makes a sorting decision, and creates inspection reports. Probus is the decision-making center of the Non-destructive Testing line. It centralizes all the sensor data and can control the test bench's actuators. The main purpose of the Probus software is to ensure traceability by creating either an individual product or a batch inspection report. They can list the detected defects and their locations and provide proof of control.
- January 2021 - Olympus Corporation launched the innovative DP series cameras that share a suite of smart features and precise color accuracy to simplify industrial microscopy imaging. The DP28 camera offers 4K resolution to provide high-resolution images. In contrast, the DP23 camera's full HD resolution is balanced with convenient features, offering outstanding value for almost any industrial imaging application, including the power generation industry.

Additional Benefits:

- The market estimate (ME) sheet in Excel format
- 3 months of analyst support

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