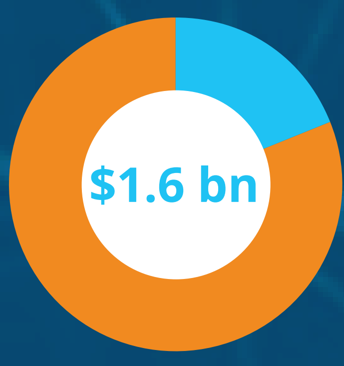
Nuclear Plant Digitalization: Market Overview

NUCLEARENERGY INSIDER

In some places **NPP operating costs have risen by 30%** in the last few years.

The industry **invests about $7.5 billion per year** in maintenance and upgrades of the plants.

DELIVERING THE NUCLEAR PROMISE



The NEI has declared the initiative a success, with U.S. **Nuclear Plant operating costs reduced by 19%** since 2012 and **achieved $1.6 billion in savings.**

The NRC's annual fees for licensees have also been **reduced by approx. $130 million**

(as of December 2017)

The next phase known as the **'Forward Strategy'** will aim to advise the industry on the continuation of modernization efforts

ZEC PROGRAMS

In the face of demand for low carbon emission energy sources, **2 states have already approved 'Zero Emissions Credit'** to provide additional revenue to at-risk nuclear power plants.

State action prevented the premature closure of 5 plants in the last year, **but 9 plants have announced plans to retired ahead of their license expiration date** over the next 6 years.

MODERNIZATION

Integration – **Utilities will invest over a quarter of their IT budgets** on integrating new technologies with legacy enterprise systems.

Cloud – By 2018, **cloud services will make up half of the IT portfolio** for over **60% of utilities**.

Most challenging aspects of testing digital implementation are: Integration services (including local, private, and public cloud), Multi-channel interface (mobile, social, traditional), Data and Service orchestration, End-to-end workflows

CYBER SECURITY

As of 2018, cybercrime is estimated to cost **$600 billion** across all industries annually.

Companies who file for an application to operate a nuclear reactor **have to submit a cybersecurity plan to NRC**

Nuclear plant safety systems are **isolated from the internet**

The biggest challenges are internal human errors

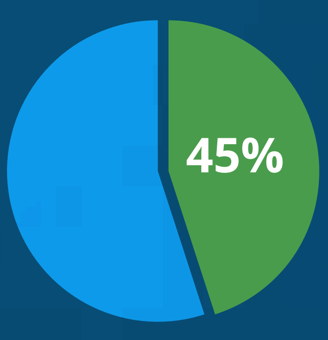
The risk of attacks aimed at the supply chain of organizations is growing in frequency and complexity

PREDICTIVE ANALYTICS

When EDF implemented predictive maintenance across their nuclear and fossil fuel generation fleet, **a single catch saved the company over $1 million.**

At American Electric Power, the company **saved more than $20 million through Industrial IoT**, and Tata Power in India had a gas turbine early warning catch that **saved nearly $300,000.**

45% of utilities' new investment in analytics will be used in the operations and maintenance of plant and network infrastructure.



RECORDS & CONFIGURATION MANAGEMENT

The IAEA Incident Reporting System (IRS) shows that on average **25% of recorded events** could be **caused by configuration errors or deficiencies**.

CM **maintains consistency** between the design and licensing basis requirements, the physical configuration and the configuration information.

INSTRUMENTATION & CONTROLS

Operating plants are transitioning I&C equipment from analog to digital. Drivers:

Ageing & obsolete equipment

Inefficient work-flows hindering plant O&M

New nuclear will be 'all digital'

3rd Annual

Nuclear Plant Digitalization Conference

28-29 November 2018 • Hilton Charlotte Center City, Charlotte, NC

Digital innovation to deliver competitivity priced nuclear power
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