

WEBINAR

# Process Automation and Energy Industries



August 18<sup>th</sup> 9am CT

Future Leader Alum



Tilak Pinnamaneni,

First Year Future Leader



Sherry Gabra

# ECC

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It is the intent of the ECC Board of Directors and its Executive Advisory Board that the business of the ECC is conducted within an anti-trust and competition law sensitive environment and in strict compliance with federal anti-trust and competition laws.

### Meeting Guidelines

- No discussion or sharing of any company's confidential or proprietary information (e.g., purchasing plans for products or services, specific merger or divestment plans, market allocation, development plans, compliance costs, inventories / costs, etc.)...only publicly available information may be discussed or shared
- No discussion or agreements, either explicit or implicit, regarding prices of particular products or services of a company
- No forecasting of prices for goods or services
- No sharing of information that your company considers to be confidential or sensitive, even if that information does not fit in any of the above categories.

# Tilak Pinnamaneni

Vice President, US Division Manager Energy Industries, ABB

## Experience:

- **19+ years in Oil, Gas and Chemicals Industry**
  - **Process Automation and Electrification**
  - **11 years with ABB**
  - **Sales and Marketing, P&L Leadership**



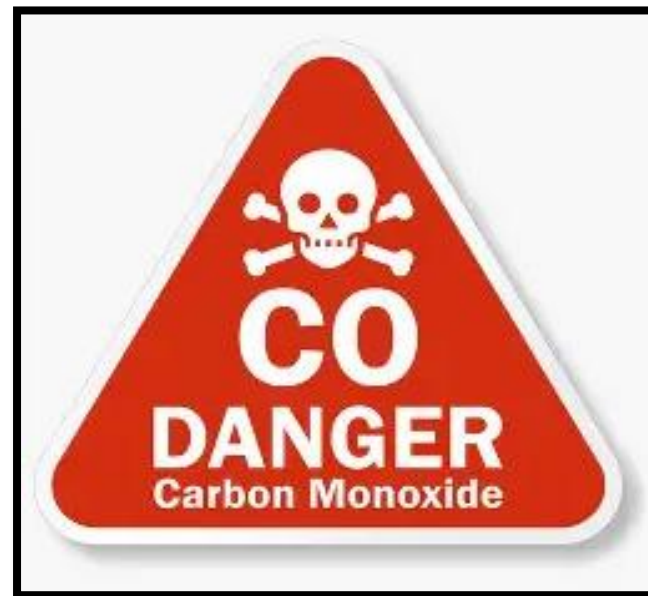
01

**SAFETY MOMENT**

# Safety Moment

## – Carbon Monoxide Dangers

### Common Symptoms of Carbon Monoxide Poisoning



### Common Examples of Areas susceptible to Carbon Monoxide Dangers:

- Pipe Leak
- Home Basement
- Small Enclosed Spaces

Carbon Monoxide is odorless and hard to detect without a carbon monoxide detector. Check your detectors every 6 months and change batteries often.

02

**ABOUT PROCESS  
AUTOMATION**



# ENGINEERED TO OUTFRAN

Industries are the beating heart of the modern world. From energy, power and mining to building, transport, manufacturing, and more – they need to meet the global demand, be more sustainable, efficient, and manage transitions. To them, “running” is no longer enough – they need to outperform.

With our leading technologies in electrification and automation, we help all industries run at high performance and become more productive, efficient and sustainable to outperform.

At ABB, we call this **‘Engineered to Outrun’**.



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# Process Automation at the heart of ABB's purpose

Creating  
success

Addressing world's  
energy challenges

Transforming  
industries

Embedding  
sustainability

Leading with  
technology



03

**EVOLUTION OF  
CONTROL SYSTEMS**



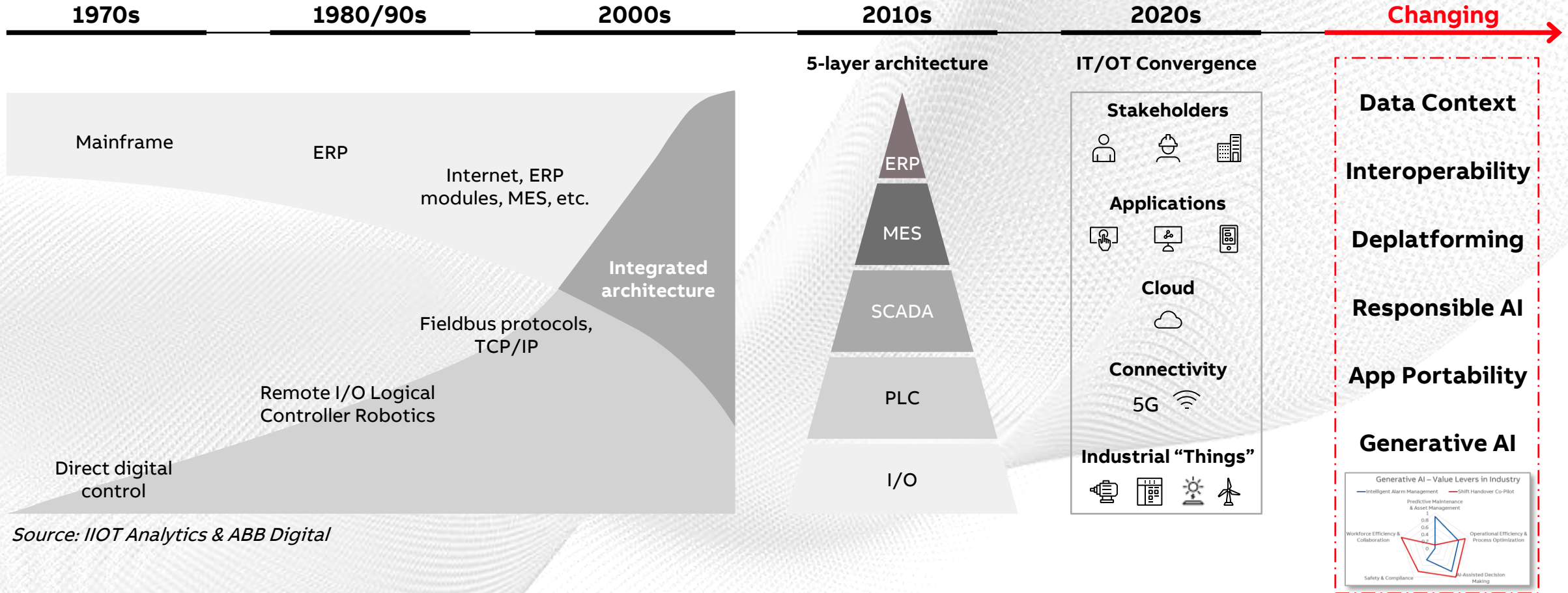
```
using System;  
using System.Data;  
  
namespace MyProject  
{  
    /// <summary>  
    /// Customer Master  
    /// </summary>  
    /// <remarks></remarks>  
    public class Customer  
    {  
        private string pCustomerCode;  
        private string pCustomerName;  
        private string pAddress;  
        private string pMobileNo;  
        private string pEmail;  
  
        public string CustomerCode  
        {  
            get { return pCustomerCode; }  
            set { pCustomerCode = value; }  
        }  
  
        public string CustomerName  
        {  
            get { return pCustomerName; }  
            set { pCustomerName = value; }  
        }  
  
        public string Ad-  
        {  
            get { return pAddress; }  
            set { pAddress = value; }  
        }  
    }  
}
```

# ABB Automation Solutions

Open, flexible and scalable technology to meet today's (and tomorrow's) challenges



# Today's Technology Trends



Source: IIOT Analytics & ABB Digital

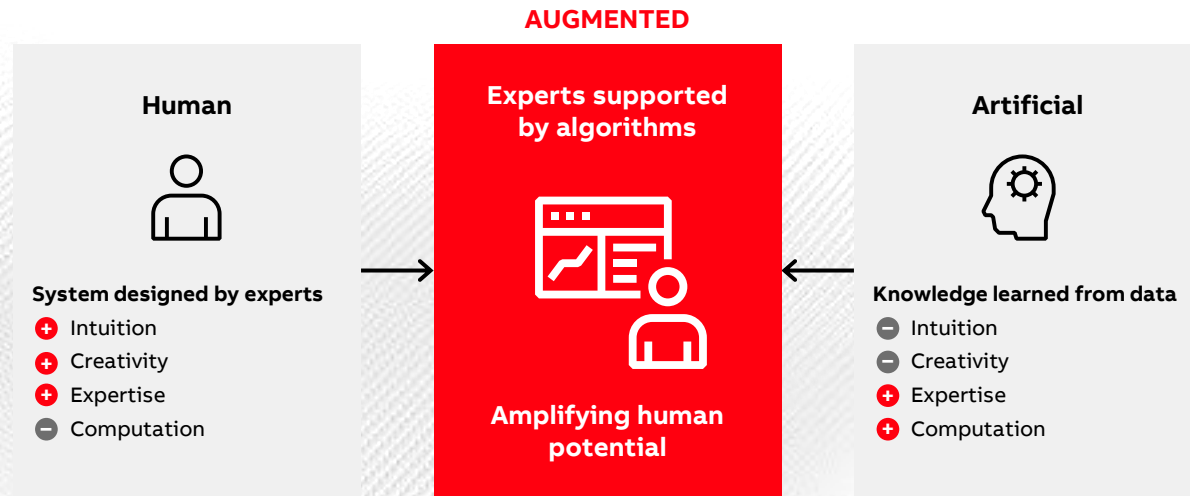
04

DIGITALIZATION/AI

# Changing roles and processes for a digital workforce

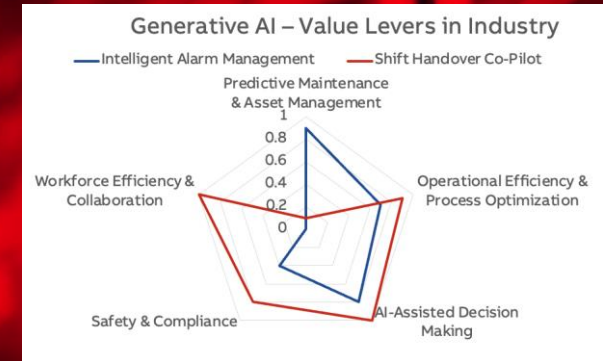
## Amplifying human potential

Autonomous operations and Industrial AI will revolutionize work by augmenting human cognitive capabilities to amplify human potential.



*[...] augmenting human cognitive capabilities to amplify their potential. They will assist operators in making better decisions in a timely manner. This will free expert personnel from mundane, repetitive tasks, and enable them to focus on higher-value activities. Thus, **in the near term, people and autonomous systems will partner, with humans making the final decision** [...]* (The DCS of Tomorrow, Whitepaper, 2022 ABB)

# Tomorrow's AI Use Cases



## Build: Code Generation

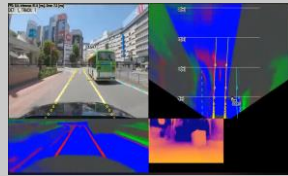
- Improved velocity
- Higher quality
- Greater standardization

```
import java.applet.*;
import java.awt.Dimension;
import java.awt.Frame;
import java.awt.event.MouseEvent;
import java.awt.event.KeyEvent;
import java.awt.event.FocusEvent;
import java.awt.Image;
import java.io.*;
import java.net.*;
import java.text.*;
import java.util.*;
import java.util.zip.*;
import java.util.regex.*;

void setup() {
  size(1280, 720);
  setupFontToIPS();
  textFont(createFont("Arial", 18));
  smooth();
}

void draw() {
  background(0xffe040c);
  if (background == null) {
    displayExplanation();
  }
}
```

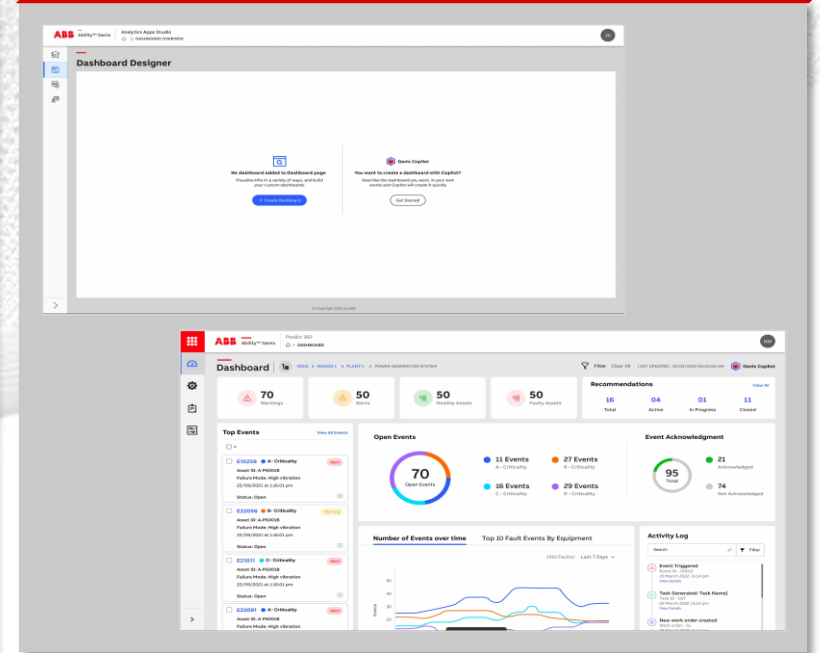
## Operate: Autonomy

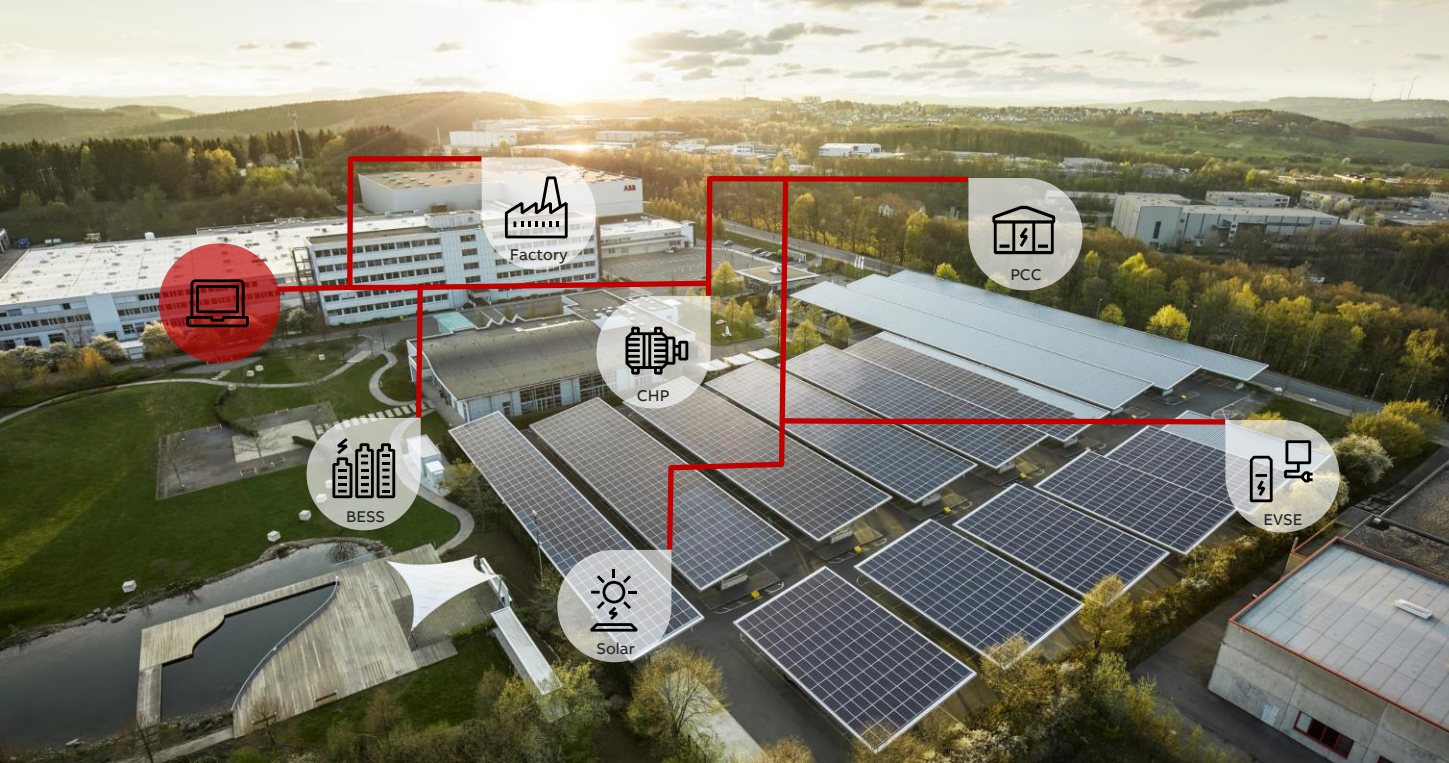


- Lane Assist
- Knowledge Engine
- Alarm Management
- Shift Handover



## Maintain: Copilots





## Today's AI Ex-2: Energy Mgmt. & Optimization

### Objective

- Integrated view of energy supply with pricing, site consumption, and areas for optimization
- Automatic energy balancing across multiple sources and demands

### Solution

- Optimax application for monitoring & reporting provides an integrated view of energy and carbon in a single pane
- Optimax optimization engine (APC) integrated to process and asset control to seamlessly balance loads and predict optimal runtimes

630t  
CO<sub>2</sub> ↓

#### Carbon Reduction

by automating the reporting and optimization

4.2%  
USD ↓

#### Energy Cost Savings

by forecasting load and optimizing runtimes and rates, incl. on-site go-gen

5%  
USD ↑

#### Estimated Revenue Impact

by participating in the energy market with real-time pricing and demand data

04

**NUCLEAR & SAFETY  
MANAGEMENT  
SYSTEMS**

## A peek into the future

Nuclear power will undergo a transformation over the next 10 years



Nuclear power is projected to reach 15% of global electricity by 2040.



It will play a growing role in delivering large-scale, low-carbon electricity.

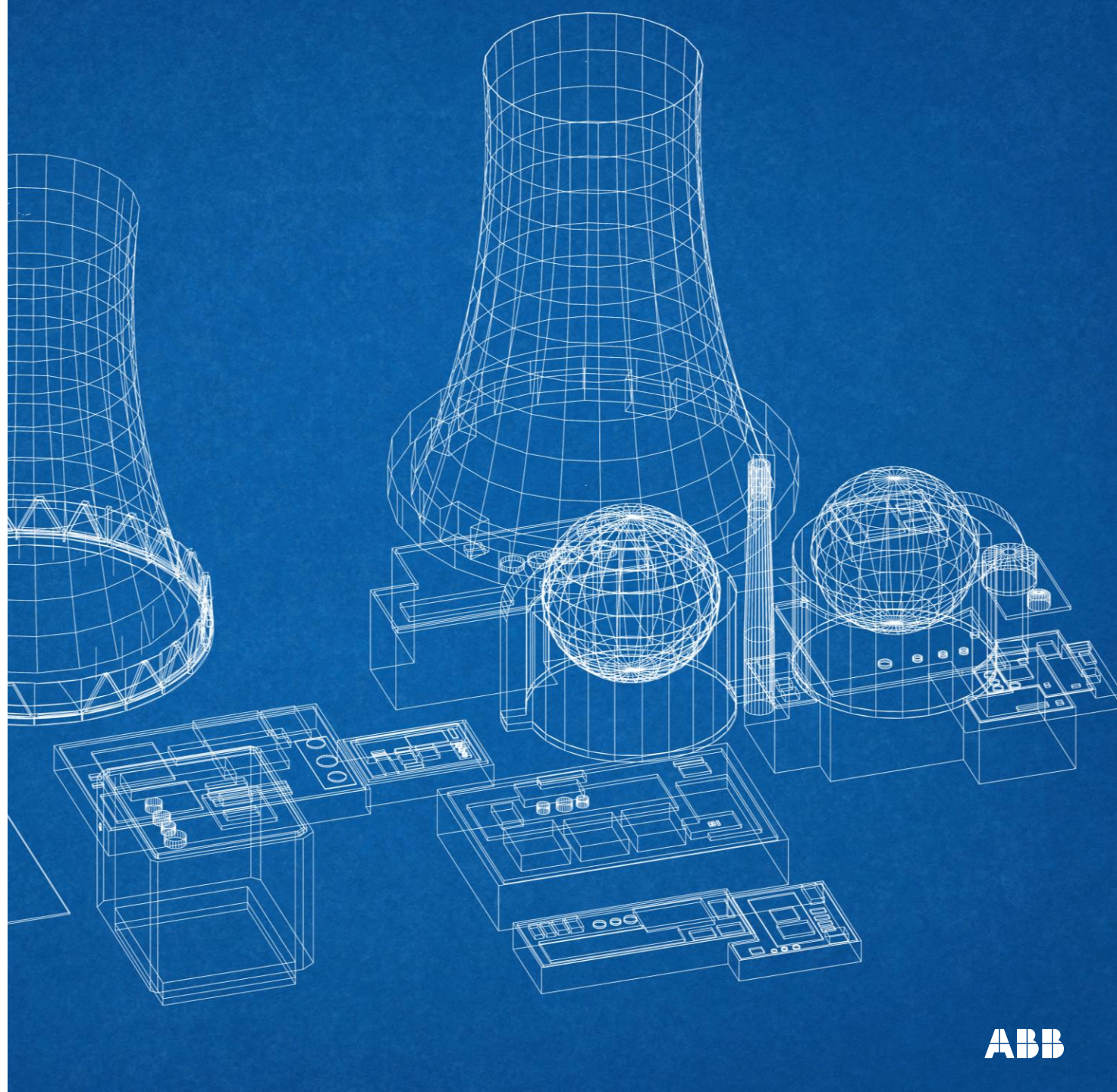


Nuclear energy aids in reducing fossil fuel reliance, decarbonizing power, and achieving net zero emissions.



Small Modular Reactors (SMRs) and Advanced Reactors offer faster, cost-effective, and safer deployment.

World Nuclear Association, 2024. *World energy needs and nuclear power*. [online] Available at: <https://world-nuclear.org/information-library/current-and-future-generation/world-energy-needs-and-nuclear-power> [Accessed 26 August 2024]



# Tomorrow's nuclear power plants must meet six challenges to remain competitive



**Optimize** their Levelized Cost of Electricity



**Minimize** CAPEX per MW and OPEX



**Obtain** licensing and regulatory approvals sooner, and more easily



**Protect** against physical threats and constantly evolving cyber threat profiles



**Safely** maintain and evolve multiple systems with minimal or no interruptions



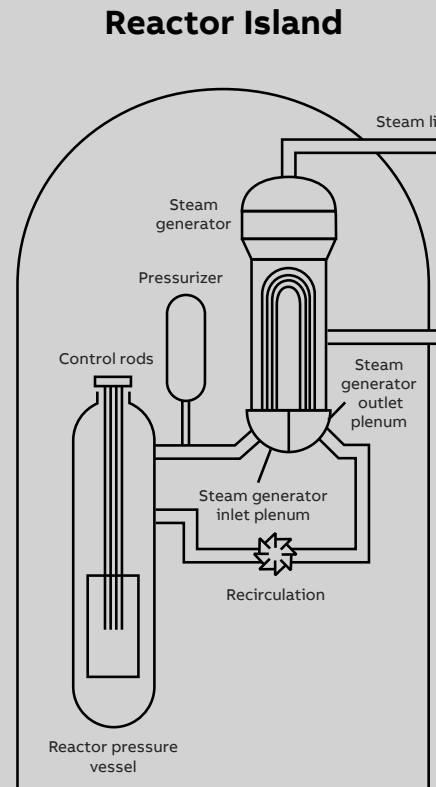
**Manage** and coordinate suppliers through projects and operational lifecycles

# Optimizing your Nuclear Power Plant operations with integrated solutions

Leading ABB Control & Instrumentation, E-Balance of Plant, Digital, Telecoms, and After Market Sales Services solutions

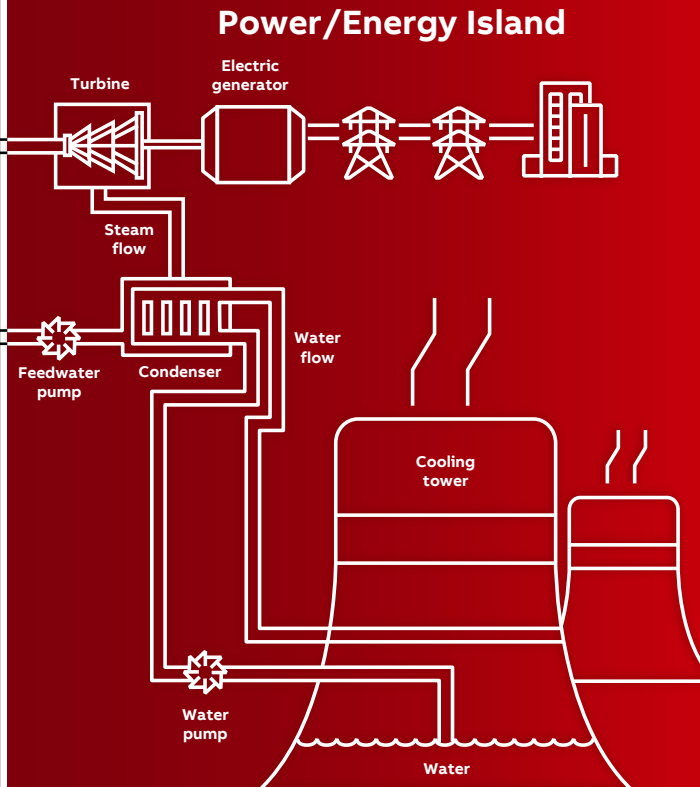
## Partner Solutions – Critical Area

- Safety Automation system
- MV & LV Electrification – E-House
- Instrumentation
- Telecoms
- Reactor Simulation



PWR – Pressurized Water Reactor

## ABB Solutions – Non-Critical Area



Full plant integrated process & power automation

### Control & Instrumentation

- Automation (SIL2 & 3)
- Control room solutions, simulators, turbine controls, protection, hydraulics
- Instrumentation

### E-Balance of Plant

- LV & HV electrical equipment
- House load, emergency power
- Excitation systems (AVR), synchronization

### Digital

- Asset Performance Management
- Cybersecurity

### Telecoms

- Physical Security
- Internal and external comms

### After Market Sales Services

- Power Generation Care Contracts
- Maintenance, Training

05

**ENERGY INDUSTRIES**

# Rio Grande

## LNG project – Train 1, 2 and 3



Customer: **NextDecade**

EPC: **Bechtel**

Location: Brownsville, TX

Segment: Oil & Gas



### ABB project scope

- Integrated Control Safety System (System 800xA)
- 7 local electrical rooms
- Electrical Control & Monitoring System
- Operator Training Simulator
- Electrical
- Drives

### Project significance

- First phase set to produce **17.6 million** tons annually through three (3) liquefaction trains
- Rio Grande LNG will be the largest privately funded infrastructure project in Texas
- Planned carbon capture and storage project



06

**ECC MEMORIES**

07

Q & A

**AABB**