



Ovation - Your Power Project Management and Solution Partner

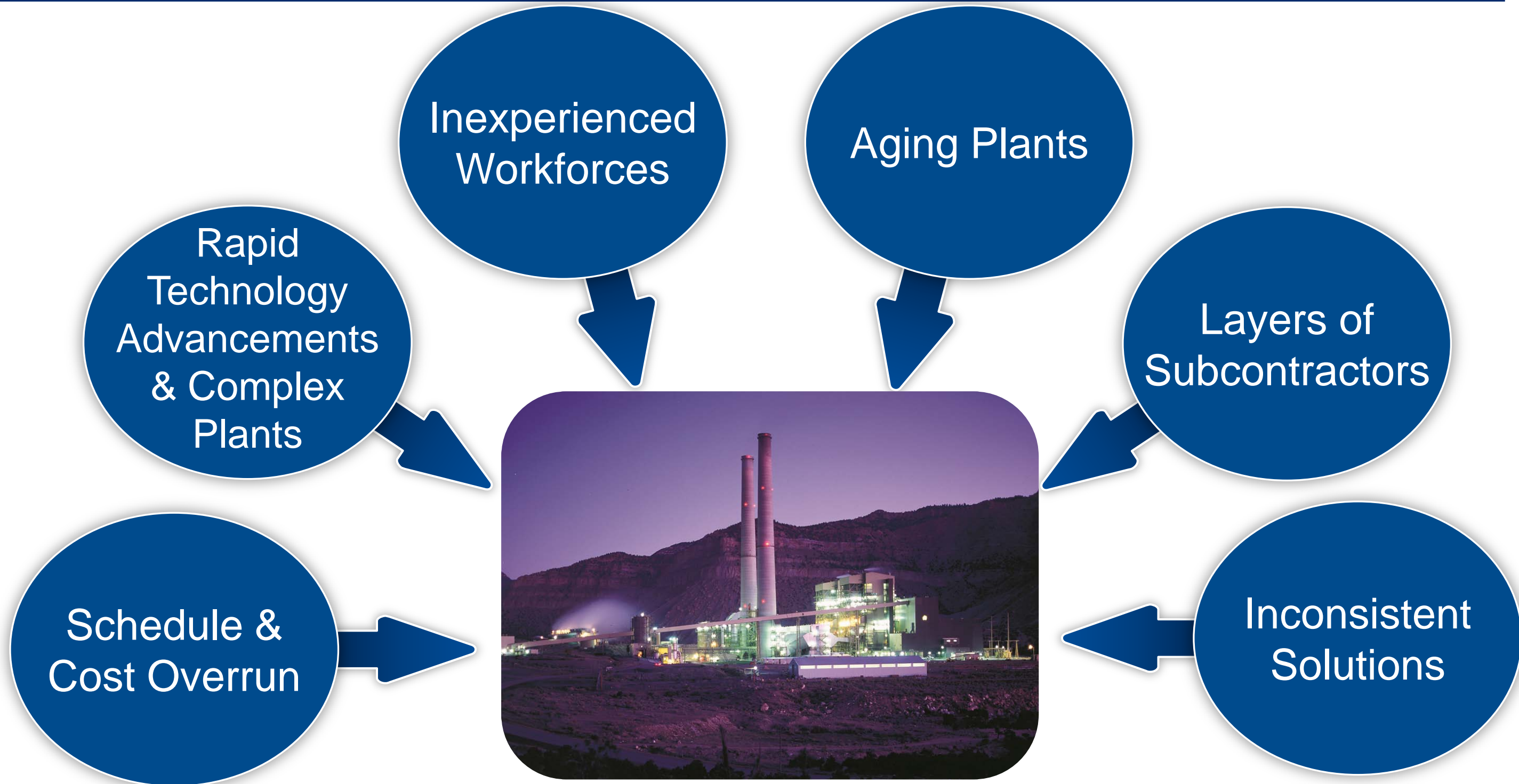
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Emerson Process
Management Asia Pacific



EMERSON[™]
Process Management

Next Generation Power Plants – Project Execution Challenges



Right Technologies and Right Automation partner will help overcome challenges

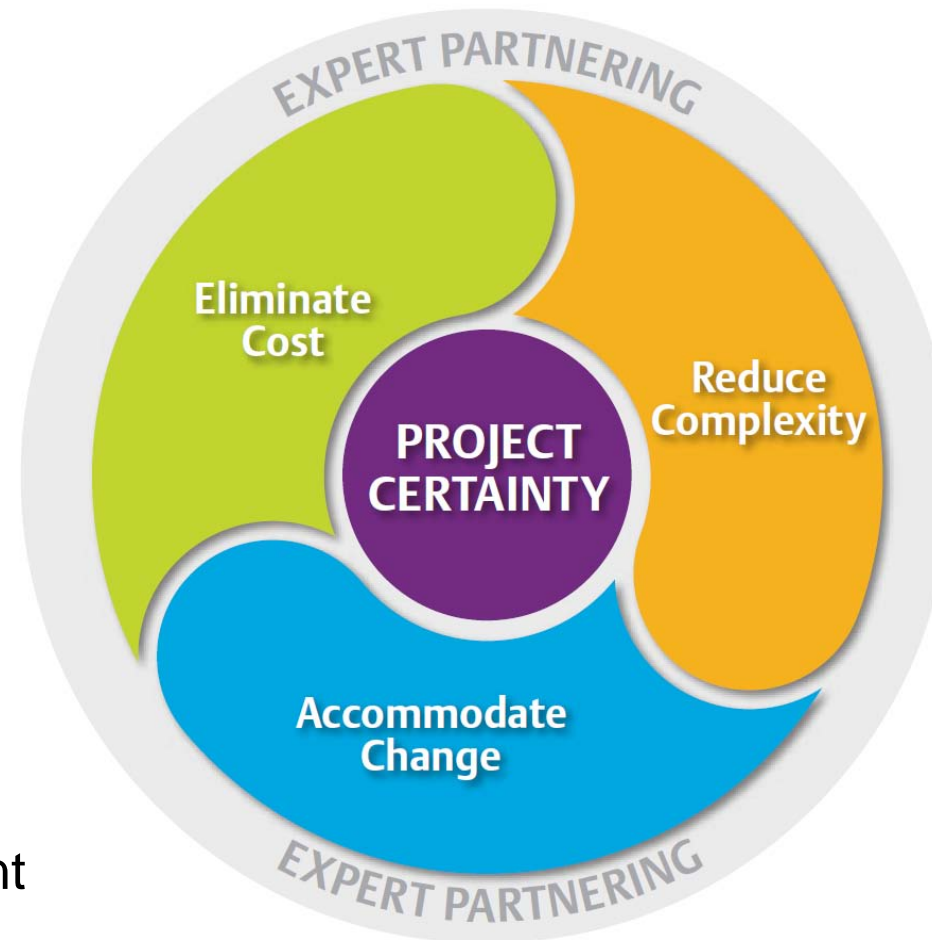
Project Certainty Enables Our Customers to Look at Projects Differently

Eliminate Cost

- **Eliminate Unnecessary Work**
- **Automate Steps to Reduce Hours**
- **Utilize One Common Platform for Plant-wide Controls, Monitoring and Diagnostics**

Expert Partnering

- **Strategy Alignment:** Consulting and vision, FEED, integrated project management and life cycle management
- **Application Expertise:** Industry knowledge and deep understanding of automation technology
- **Global Engineering:** dedicated project resources; global tools and processes



Reduce Complexity

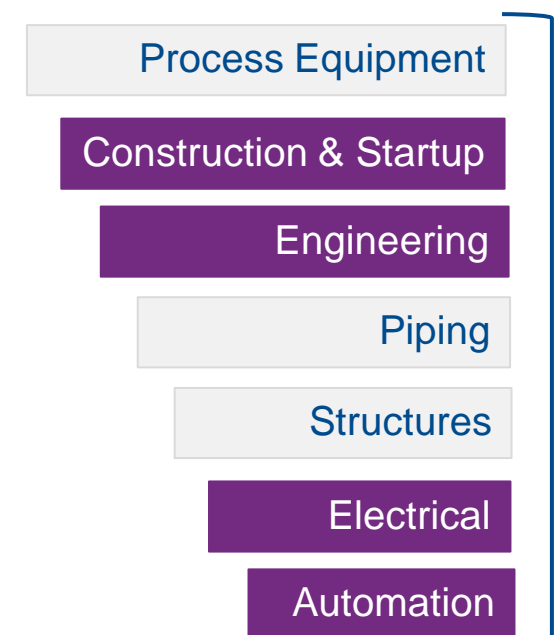
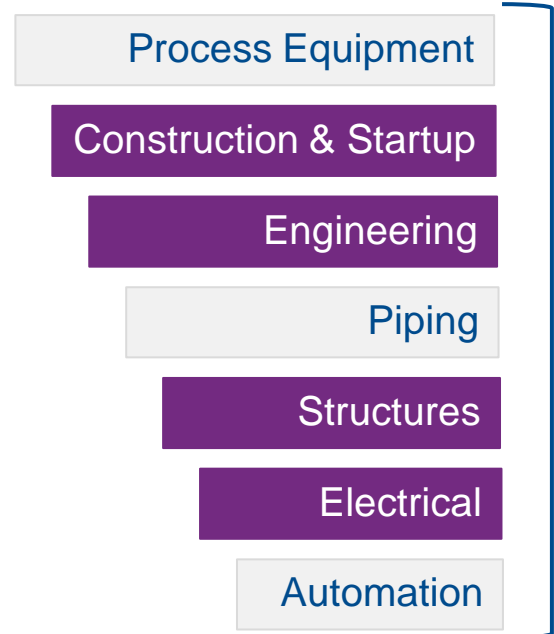
- **Utilize Cloud Engineering**
- **Decouple Dependencies**
- **Embedded Plant Simulation**
- **Improve Information Management**

Accommodate Change

- **Add Speed & Flexibility**
- **Absorb Late Design Changes**
- **Eliminate Plant Start-up Delays**

We are Collaborating with Customers to Develop New Technologies and Enhanced Work Practices that Realize the Vision of Project Certainty

Emerson is Delivering the Value of Project Certainty Today



Eliminate Cost

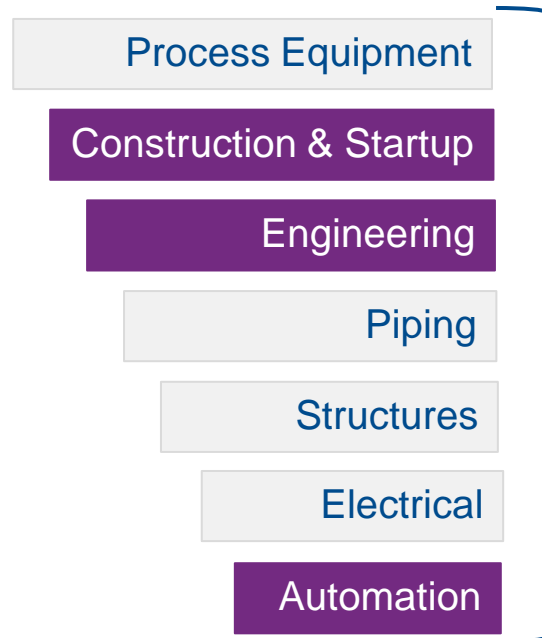
Wireless Plant network and Remote I/O with unified control System eliminate major cost of Wiring & Control room hardware

- E&I Engineering
- Installation
- I/O Equipment
- Terminations & I/O Labels
- Reduce Control Room Space

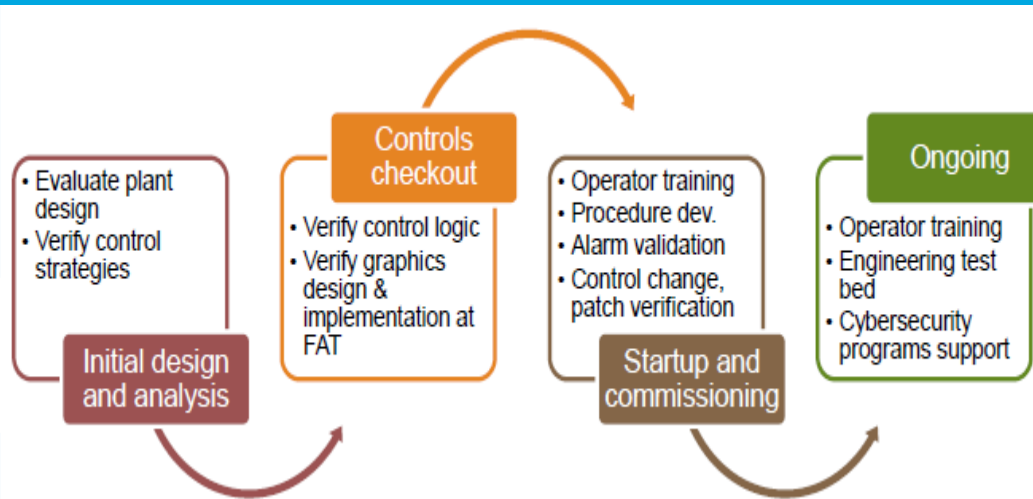
Reduce Complexity

- Unified System Architecture results in shorter project schedule
- Fewer configuration hours using SAMA symbols in Control schemes.
- DBID Engineering tool to capture and map the information in to the Ovation System database
- Software FAT in simulated environment

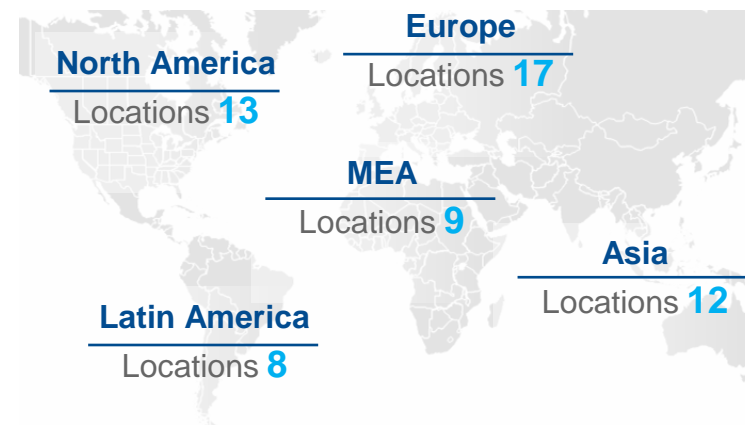
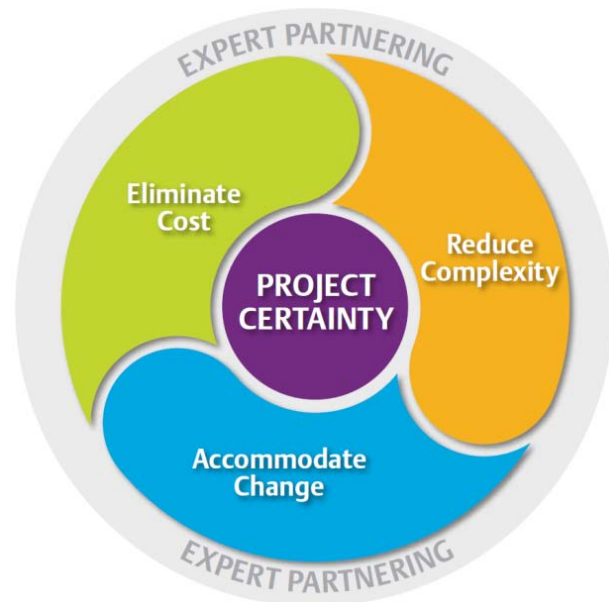
Emerson is Delivering the Value of Project Certainty Today



Accommodate Change



- Testing on the simulator before implementing in the real plant.
- Active PDF enables quick offline review.
- Unified Database for one point modification.
- Quick Comparison to list the changes using comparison tool.



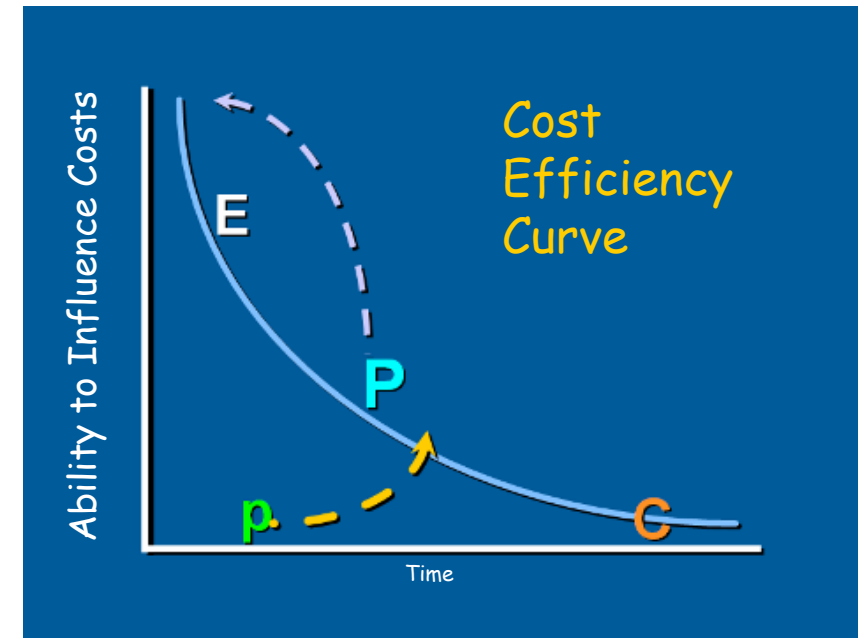
- Global team of over 2,500 resources across 59 locations
- Over 500+ dedicated for Power Industry in AP
- Deep industry and automation knowledge
- Established partnerships with end users and EPCs

Expert Partnering

The Construction Industry Institute (CII) Recommends Using the PEpC Process



- CII studied effect of early involvement of strategic suppliers
- Developed PEpC Model
- EPC becomes PEpC
 - P: Procure strategic suppliers **first and early**
 - E: Engineer (by contractor partnered with strategic supplier)
 - p: procure commodity items
 - C: Construct

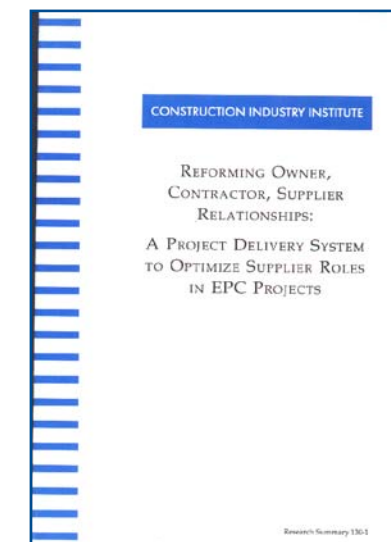


Construction Industry Institute indicates:

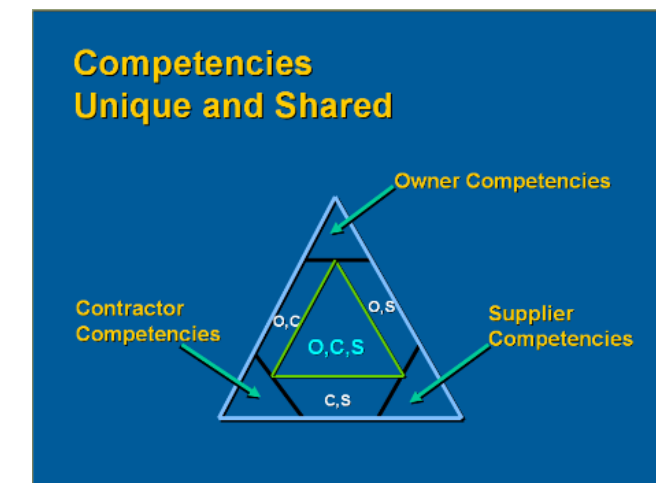
4 – 8% cost savings

10 – 15% time savings

Also called **MAC** = Main Automation Contractor or MICC



Research Summary 130-1



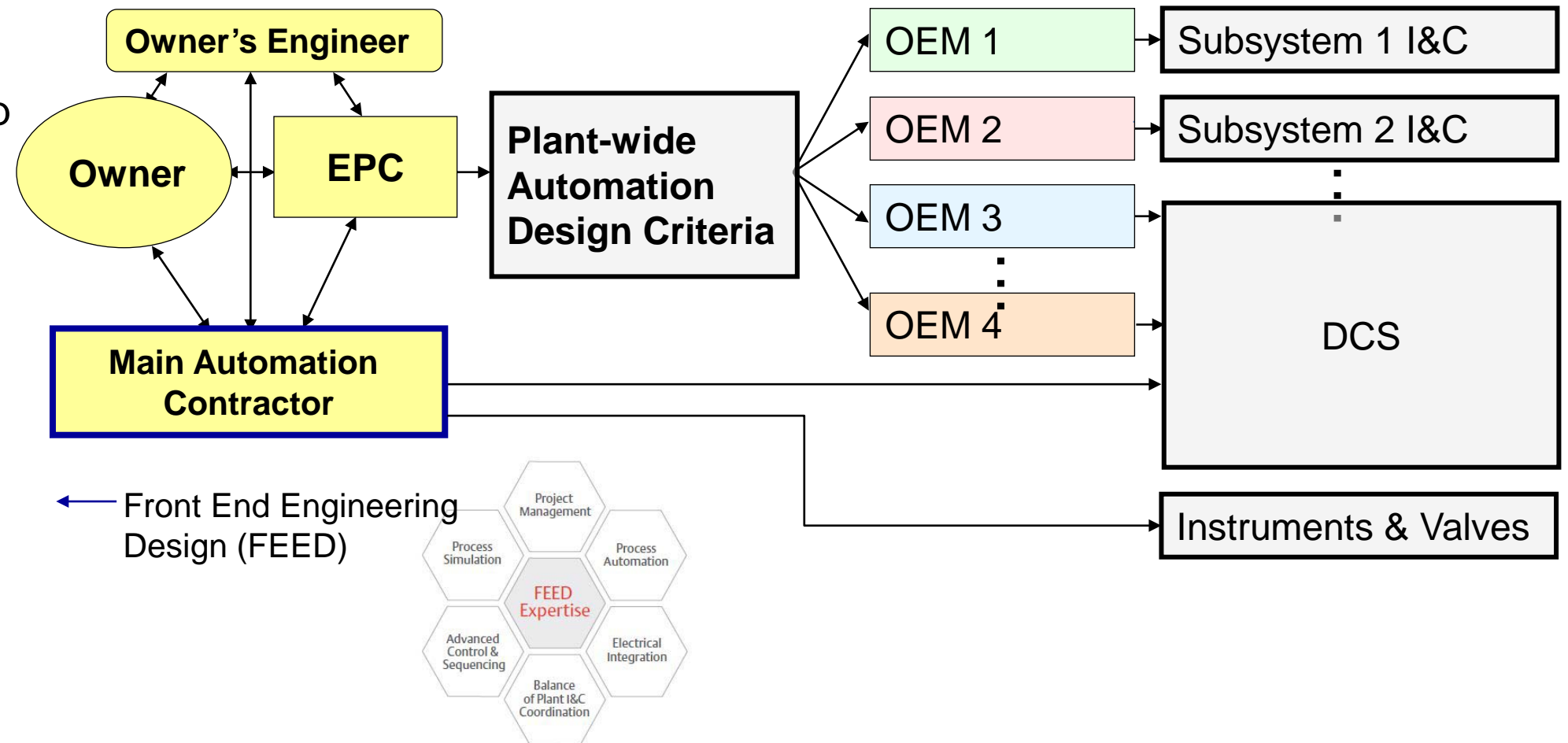
www.construction-institute.org

The ability to influence the cost of a project is greatest at the beginning of a project – bringing strategic suppliers in early is essential to success.

Main Automation Contractor Approach Reduces Project Risk and Delivers Optimal Solution



- The Main Automation Contractor (MAC) is engaged at initial project phase with Single point of accountability
- The Main Automation Contractor works with the Owner and EPC to define a plant-wide automation design criteria, and provides total automation solution for project including
 - Front End Engineering & Design (**FEED**)
 - Detail Engineering & Design
 - Procurement
 - Commissioning & Startup
 - Training
 - Lifecycle Support

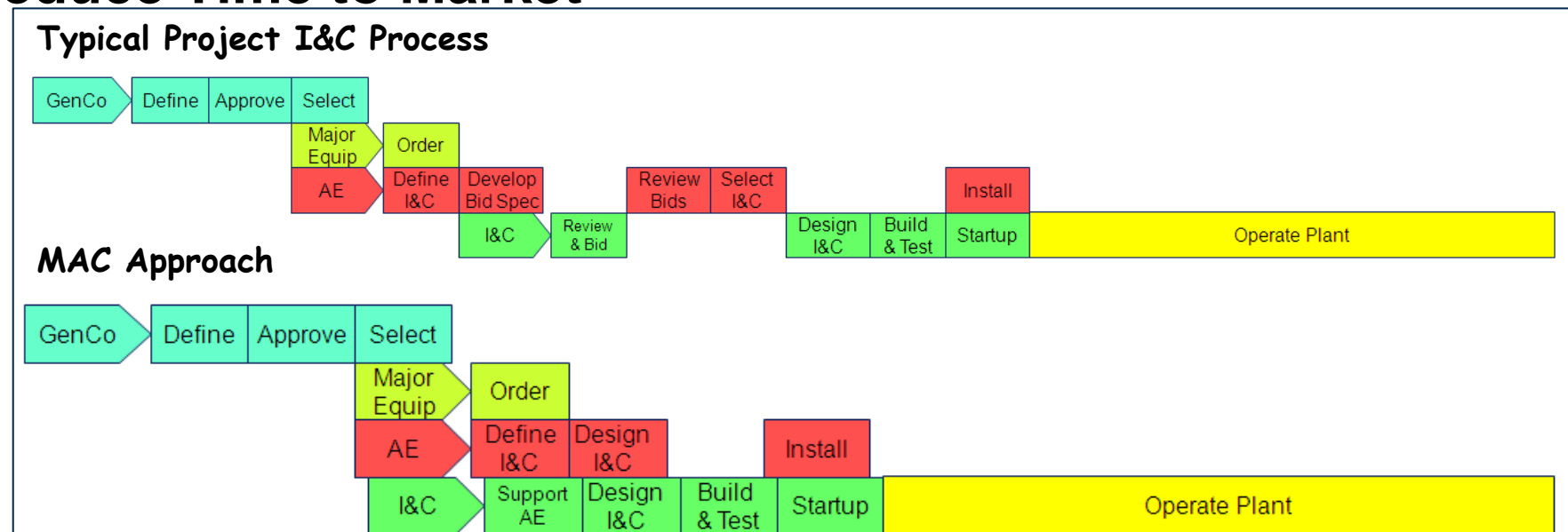


Consistent design and deployment, reducing capital and O&M costs

Primary Reasons for Adopting MAC Concept



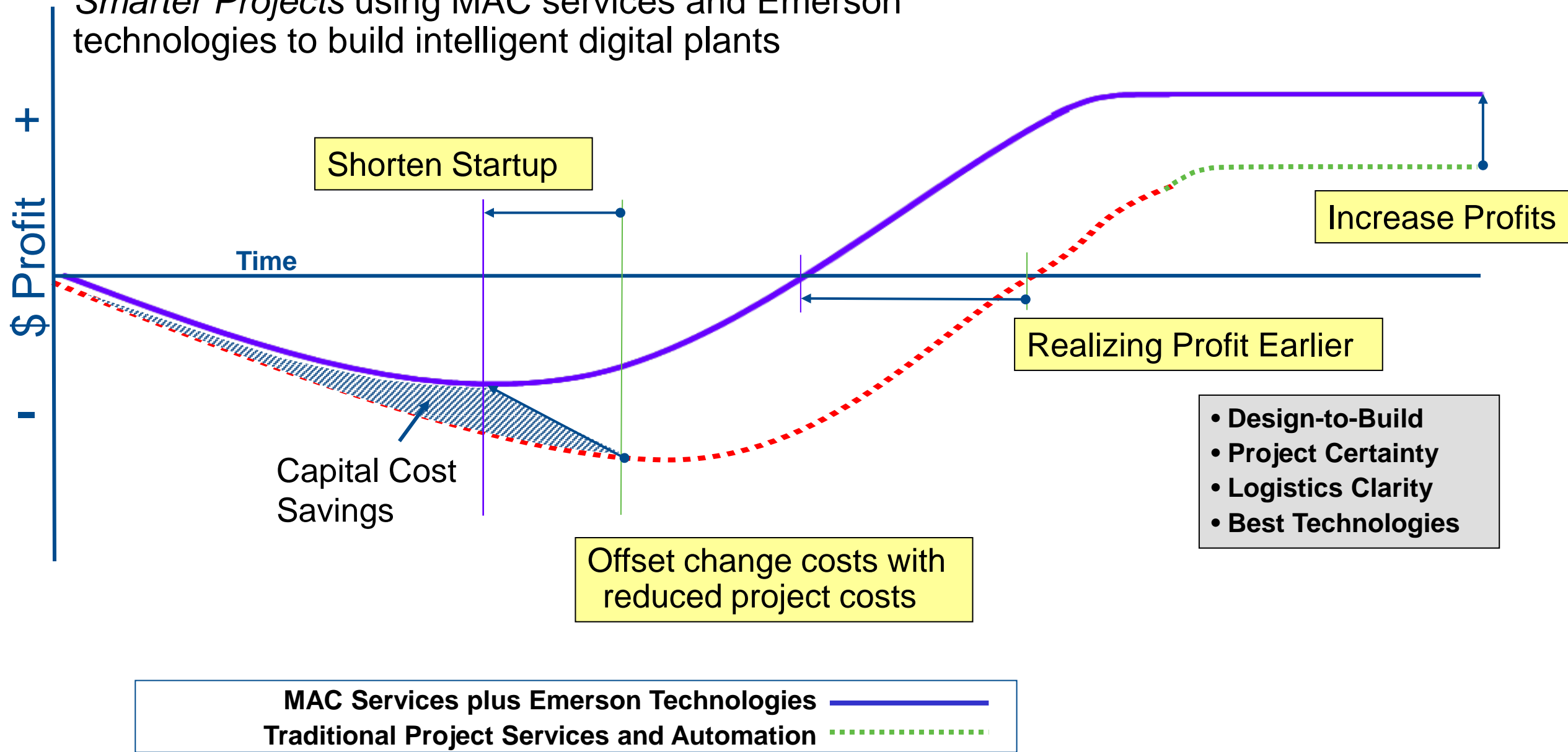
- **Mitigate traditional I&C problems**
 - Numerous changes throughout project execution
 - Unforecasted scope additions and resource requirements
 - Design inconsistencies and poor interfaces between project components and design teams
- **Streamline processes for project cost savings**
 - More focused and proficient engineering
 - Standardized and scalable designs
 - Reduced and improved interfaces, Reduction in equipment testing
- **Leverage technology for reduced O&M costs**
 - Best available technology applied with lowest lifecycle costs
 - Integrated predictive intelligence for improved reliability
- **Reduce Time to Market**



Savings from MAC Projects with Intelligent Digital Architectures



Smarter Projects using MAC services and Emerson technologies to build intelligent digital plants



Project – Amata B.Grimm Power (Thailand) Retrofit: 165 MW CCPP (2x GT/ 2x HRSG/ ST)



Project Certainty : Case Study



EMERSON
Process Management

Project Overview



Customer: Amata B. Grimm

Project: Control system retrofit for Amata Block 1, 165MW CCPP

Emerson Scope:

- Ovation DCS Control System
- Overspeed protection system and speed monitoring

Challenges

- The Plant is 16 years old
- OEM system consist multiple control systems
- Systems are black boxes and unable to see functions to perform plant diagnostic
- Could not do servo valves calibrations by I&C group, need Siemens Engineers to fly in to perform calibration
- Large and costly spare part inventory due to old DCS multiple platforms
- Outage must be less than 40 days
- No impact on field equipment. One GT to remain in operation



MAC approach helped to deliver on time, within budget !

Key Element of Project Certainty



Eliminate Cost

- **Reduce maintenance cost:** Integrated servo-valve calibration. Ovation enables customer plant engineer to calibrate and tune GT control valves without the need for OEM Field Service Engineer.
- **Reduced O&M cost:** Transfer from multiple to singular platform with spares parts and training needs, greatly reduced

Key Element of Project Certainty



Reduce Complexity

- **Unified System Architecture:** Integrated turbine protection systems and DEH controls into Ovation
- **Uniform philosophy** across the plant
- Software Testing in **Simulated environment**
- Safety system simplified to use “Master Relay” and introduced trip system diagnostic functions

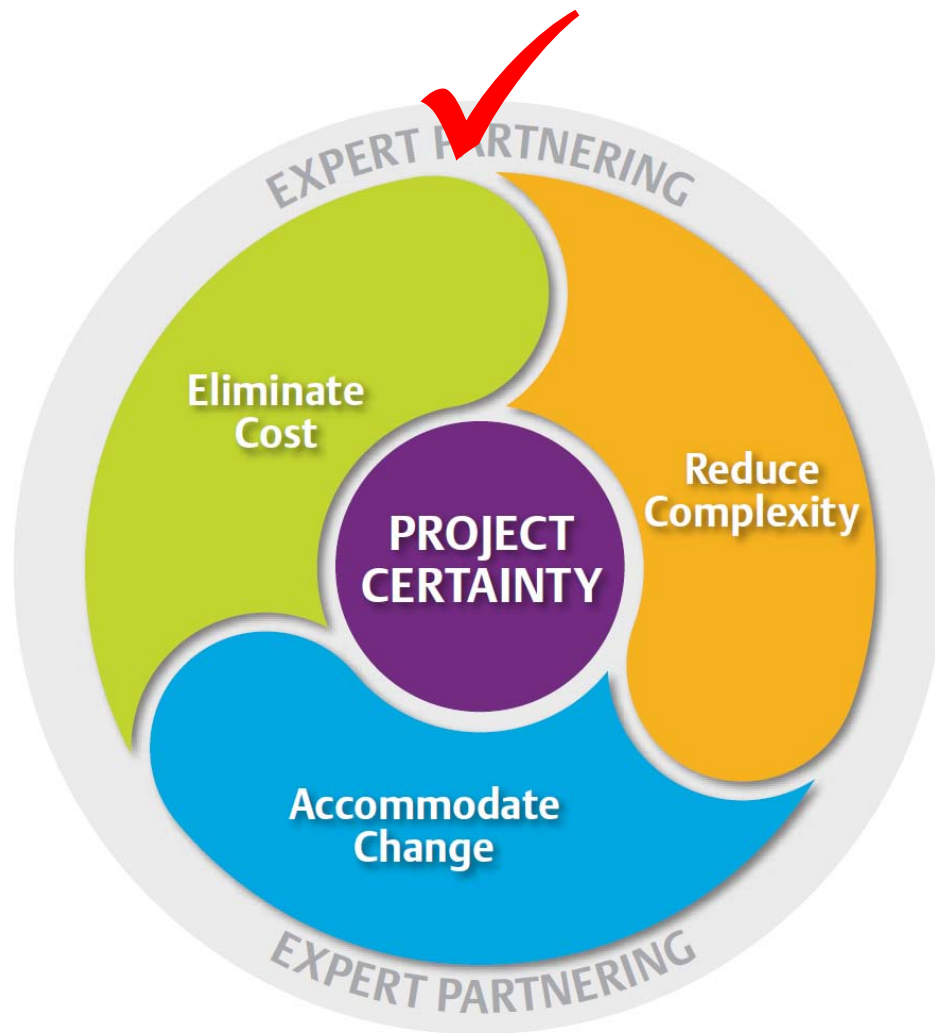
Key Element of Project Certainty



Accommodate Change

- **Expandable & Interchangeable:** Integrated existing WTP control into Ovation DCS
- **Flexible Design:** User-friendly control function display with same look and feel of existing Operator Interface

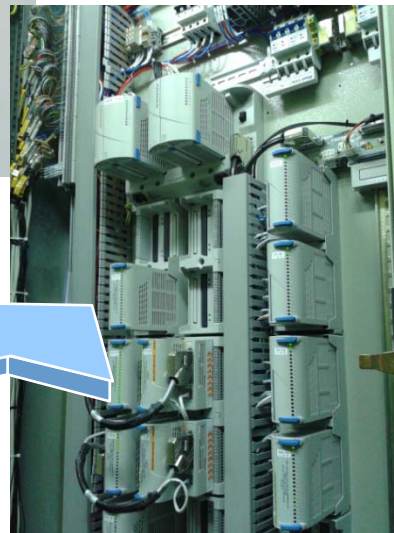
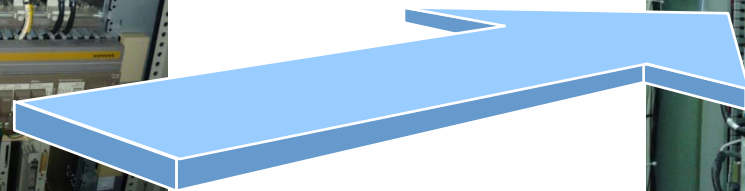
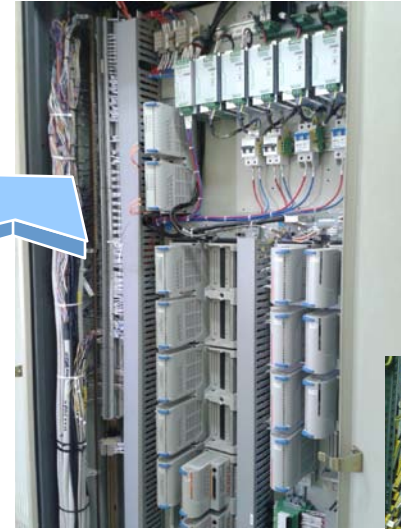
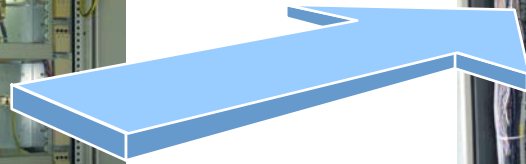
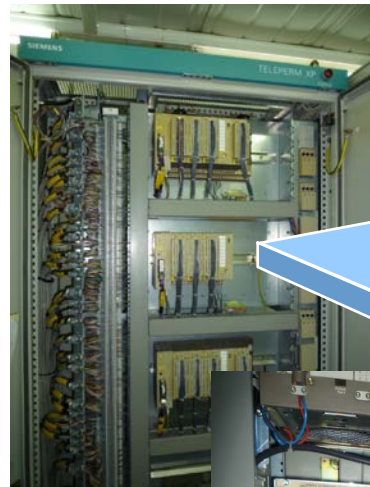
Key Element of Project Certainty



Expert Partnering

- **Plan with customer** on pre-outage activities to cut down outage period.
- **Performance** during 1st Unit shutdown encouraged end user to reduce shutdown time of 2nd unit from 40 to 30 days, thus earlier return to generation production.

Photographs – Before and After



Obsolete Teleperm Controller and IO system

Ovation I/O system

New Ovation HMI



**Thank you
for your Attention**