ICA Engineering

Capabilities Brochure

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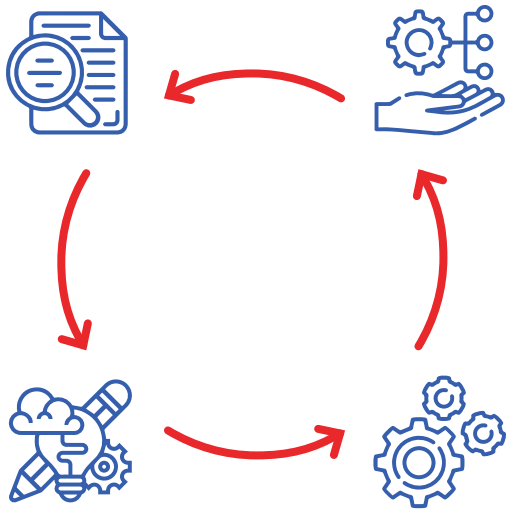
Project Life Cycle

DEFINE

Fully defining your requirements for now and the future.



DEVELOP

Comprehensive system development including acquisition, integration and fabrication.

DESIGN

Creating a solution optimized for your application.

DELIVER

From installation and commissioning to training and support.

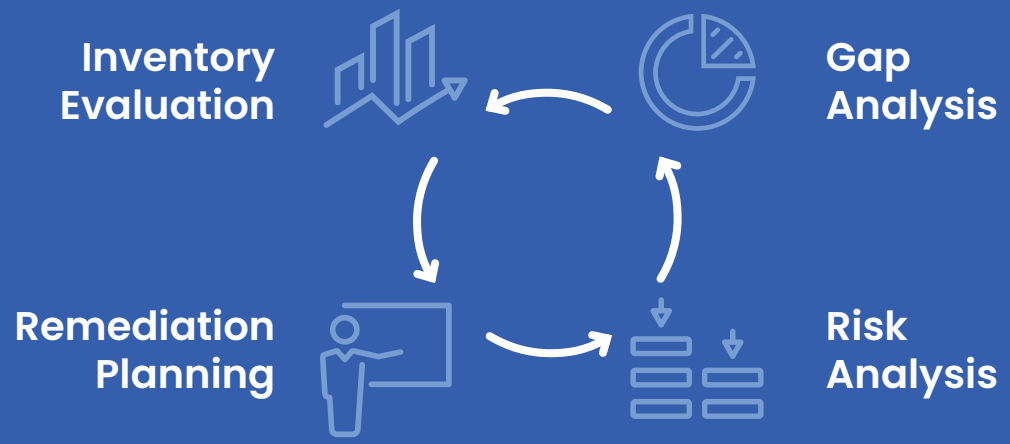
The results of our proven approach are powerful and include:

- Increased productivity
- Reduced downtime
- More accurate data
- Improved operational efficiency

In short, we are a critical extension of your operations' industrial automation team.

Systems Lifecycle Evaluation is broken down into four main steps:

Each step will look different depending on your industry. For example, food manufacturing industries are often at risk from fire or explosion due to small particles in the atmosphere, like flour. In cases like this, remediation planning might explore the pros and cons of intrinsic safety technologies versus explosion-proof containment.



Inventory Evaluation

The first step in any system lifecycle management process has to be an evaluation of what devices make up your systems. These will include controllers, HMIs, network switches, variable frequency drives, remote devices such as IIoT linked to industrial automation, plus all the various program files, development and runtime software, or apps linked to every device. In addition to cataloging the inventory of hardware and software, it's equally important to catalog what system documentation such as design specifications, user manuals, and drawings are available, and how up to date they are.

Cataloging everything you have goes beyond a simple list of devices. Makes, models, and even firmware editions are vital to ensure that any risk analysis and remediation planning is relevant. To keep the catalog useful, a process should be established to ensure it is quickly updated when hardware, software, or firmware upgrades occur, and that system documentation remains current. Proper documentation is vital to making this inventory an effective tool for business continuity.

Gap Analysis

Once an effective inventory has been created, it's time to start a thorough gap analysis. Gap analysis is the space between where you are now and where you need to be in terms of spare parts, security, documentation, or other aspects of maintaining business continuity. What is it that you're missing?

Many legacy systems don't have the ability to create meaningful backups or might be missing development files that are tricky to obtain. This becomes a risk when devices fail and operators are faced with the challenge of getting them back up and running. Some equipment may have come to the end of its lifecycle, meaning that firmware updates or spare parts simply aren't available anymore. Manufacturer's technical support and repair services may be unavailable. Understanding the potential causes of issues like this is a critical part of gap analysis. For example, an automated machine on the factory floor that runs on older software might not be upgradeable to software that meets current security requirements, due to hardware or operating system limitations. This leaves a "backdoor" into the control system, potentially creating access for cybercriminals and placing the whole industrial setting at risk of shutdown or sabotage.

Assessing the gaps between what's desirable, what's necessary, and what your organization actually has is vital for identifying potential risks.

Risk Analysis and Creating a Remediation Plan

The final two steps are assessing your industrial organization's potential points of exposure to risk and creating a meaningful plan to deal with those situations.

Risk Analysis

Once you have an awareness of the infrastructure of your industrial systems, you can start assessing what risks are most likely to impact your business continuity. Understanding how all the pieces of your organization interconnect will help you determine the potential impact should any one of them fail. Common risks to a variety of industrial settings include:

- Lost configuration and device failure
- Product environment change
- Unauthorized access to documents, equipment, or areas of your facility

Human resourcing and a lack of qualified staff can also be factors in reduced production. "The Great Resignation" has led to any number of highly skilled staff taking their experience and deep knowledge of systems and equipment elsewhere. New employees may have the drive and will to learn new skills, but it takes time and extensive training to fill those gaps when experienced workers retire or simply leave. They may find legacy technology unfamiliar and non-intuitive. This situation is exacerbated if you don't have a working knowledge base, including all aspects of machinery, computers, and other equipment. Relying on one person to be the expert in IT or for a particular piece of machinery only works until that person leaves.

Problems also occur as devices become obsolete. End-of-life equipment may not receive support from vendors, leaving organizations with useless equipment that can't be upgraded or repaired. Equipment failure should be a situation that's quickly remedied, but if you can no longer get spare parts for that piece of equipment, production may be slowed or halted as you seek alternative solutions.

Supply chain issues are another risk, and one that's become a significant problem since the pandemic. Bottlenecks at ports cause shortages in raw materials and equipment parts, while delays for logistics partners cause customer and client dissatisfaction. Ensuring you have clear channels of communication along your supply chain and that your third-party vendors have adequate cybersecurity to protect their links in the chain is a key part of reducing risk.

Remediation Plan

Remediation planning or hazard planning means putting in place contingencies to help prevent shutdowns of your industrial setting in the event of any of the scenarios highlighted in your risk analysis. A plan should take into account:

- What risk it addresses
- Prevention scenarios
- Methods of mitigating damage and keeping production continuous
- If production does stop, the length of time to recovery
- How to log incidents and report them to the relevant authorities where necessary
- How to use information about incidents to improve the hazard plan for potential future events

Effective remediation planning will consider all the possible risks your organization could face. Having a suite of plans that cover a range of situations means your remediation solution is customized to the size of your business and the scope of the incident. The prevention strategies you identify might require you to take action right now, well ahead of any incident. This action could include improving your in-house knowledge base, upgrading safety processes and equipment, or even updating legacy systems.

Software and Hardware Platform Capabilities

Custom software application development requires industry-leading experience in multiple programming languages and hardware platforms. At ICA Engineering, we can work with you to create solutions in these program languages.

- IEEE Ladder Logic
- Structured Text
- Function Block Diagram
- Sequential Function Chart
- SQL
- Python
- HTML 5
- SQL
- C/C++
- XML
- And more

Our expert team has the programming knowledge and experience you need for tailor-made solutions in your facility. Depending on your situation, we can choose the optimal programming language for your system or develop software using the existing program language of your system. For hardware platforms, ask about the following options.

- Intel/AMD based Processors
- Allen Bradley ControlLogix, CompactLogix, Micro800, PLC-5, SLC-500, Micrologix, PanelView
- GE/Emerson RX3i, RX7i, 90-30, 90-70, Genius
- Siemens S7-1200, S7-1500, S7-300, S7-400, S7-200
- TI/Siemens 505 Series
- Modicon Quantum, Twido, 984
- Automation Direct
- Mitsubishi
- Mission Communications
- And more

Software Platforms

- Inductive Automation Ignition
- Rockwell FactoryTalk View, Historian
- WonderWare InTouch, Application Server, Historian,
- GE Cimplicity HMI, iFix
- And more

The specific hardware platform and programming language used varies depending on your current setup and your goals. New software needs to successfully communicate with legacy panels and equipment, while still offering you modern control, communication, and data collection techniques.

Documentations & Drawings

System development life cycle documentation including:

- User/Functional requirement specifications (UFRS)
- Functional/Detailed Design Specifications (FDS/DDS)
- Operations manuals
- User SOPs
- Training manuals and system validation documentation
- Requirements traceability matrices
- Test protocols – IQ/OQ, validation summary report
- Development of power, motor, PLC I/O drawings, and P&ID drawings with AutoCAD

Calibration

Collaboration with clients to establish functional and detailed design requirements for electrical hardware design, PLC and SCADA control systems. Assessment and evaluation of control and automation systems against regulatory requirements (i.e., FDA) to the development of appropriate remediation plans.

Bid Packages

We provide bid packages which may include these 4 parts: the IFL letter, Procurement Lobbying Packet, a collection of reading material on the Standard Clauses for State contracts and the detailed specifications of the contract. The following documents may be included in your bid package: Bid Proposal: References; Confirmation of Compliance; Certification: MacBride Fair Employment Principles; and The Small, Women, Minority Owned Business Enterprise Questionnaire.

Manuals & Trainings

Development of operations & maintenance training programs, and conducting operator and maintenance training classes in the use and service of PLC & SCADA systems.

Support & Troubleshooting

On-site investigation and diagnoses of process, controller, SCADA, field instrumentation and I/O to isolate and eliminate system and process defects. Troubleshooting the operation of PLC, and SCADA applications. Legacy systems serviced. Service contracts available.

legacy systems - they can: maintain, improve, or replace

Optimized Processes

Why invest in automation design from our award-winning team? At ICA Engineering, we help you reduce errors and optimize your process with expert automation panel design. Don't let an underperforming electrical system or obsolete control panel affect your automation system reliability, but work with our team to create and implement an effective solution.
We approach the process by looking for ways to achieve optimal functionality, cost, and safety. These factors affect the hardware and software decisions made throughout the process.

Another key component of an optimized process is safety. Many end-users wait to consider safety until after the primary control functions have been decided, but we integrate safety specifications and objectives into our holistic approach.

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