

INDUSTRIAL COMMISSIONING ASSOCIATION MONTHLY NEWSLETTER

For commissioning professionals working on
industrial plant processes and energy system projects



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Commissioning Standard**

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PRESIDENT MESSAGE

By Paul Turner, P.Eng., PMP

The Industrial Commissioning Association is undergoing a transformation. The interest in commissioning has been great to see, and the growth of the association requires that we bring on more people to the organization so we can better serve the industry. This is exciting, as we grow and form a new structure to allow more people to contribute to this movement, we'll be electing a board of directors to allow input from each of the industries that make up the commissioning community to maximize the impact that this organization can have.

Over the next while, you may notice some changes as we grow into a larger framework to serve the industry.

You can still access all the great information offered at www.icxa.net as we transition. Making these changes will allow us to provide you more support and services to help you and your projects with commissioning.

There are several other great organizations out there such as IChemE, IMechE, ICivilE, and IEEE, and this transition will better align with these organizations as we work with these groups to serve the capital projects industry.

With this, we would like to get your input on the initiatives you would like the Industrial Commissioning Association to pursue to help you and your projects.

Please take a few moments to give us your thoughts at this link: www.icxa.net/survey.

The ICxA commissioning community has grown quite quickly – there are now over 3,400 members! This means we can do so much more now that we've achieved this critical mass. There are several initiatives we could possibly pursue, such as:

- Standardization of Commissioning Processes
- Develop ISO Standards for Commissioning
- Create more training options
- Host additional virtual seminars and live webinars
- Recruiting younger engineers into the commissioning industry
- Collaborate with other industry organizations
- Form partnerships with government to mandate commissioning in contracts

- Develop industry-specific technical sub-committees to address specific topics and issues

We would appreciate your feedback to let us know what the commissioning community needs to succeed with improved commissioning of projects. Please give us your thoughts at www.icxa.net/survey.

Paul Turner, P.Eng, PMP

“structuring with a new framework will allow us to provide you more support and services to help you and your projects with commissioning.”

Partner with Novus to see the benefits of early planning.

➤ Lessons Learned

Transferable, measurable, and benchmarked improvements.

➤ Systematic Approach

Align engineering, procurement, construction, and systems completions with startup sequences.

➤ Schedule Predictability

Integrated commissioning and start-up schedules.

➤ Cost Efficiency

Reduce project costs as a percentage of Total Installed Cost (TIC).

➤ Best In Class Digital Tools

Boost productivity and minimize duplication.



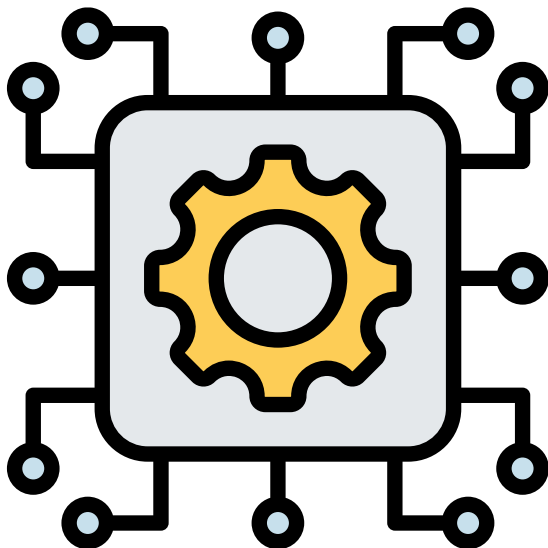
EMPOWERING THE ICXA GLOBAL COMMISSIONING STANDARD BRIDGING THE GAPS WITH TAILORED INGENUITY

by Peter Foxley

*ALIM Systems | Chapter Lead UK -
Industrial Commissioning Association*

Implementing the ICx A Global Commissioning Standard on Nationally Significant Infrastructure Projects (NSIPs)

The Commissioning Project Manager (Project Commissioner) acts as the central authority for data aggregation and asset lifecycle information management. By efficiently organizing data, standardizing processes, and curating as well as validating knowledge, they enable evidence-based, informed decision-making. This ensures the delivery of the intended social, economic, and environmental outcomes across every phase of the infrastructure project.



Digital and Cultural Transformation

In the realm of Building Information Modelling (BIM) and data management systems, we navigate a landscape defined by semantics (meaning), taxonomies (classifications), and datasets—driven by the ultimate goal of achieving **interoperability**. While this approach effectively addresses the high-capital costs of heavy civil engineering design and construction, it often falls short when confronting the intricate, systemic challenges posed by electro-mechanical and automated systems.

For over three decades, major projects worldwide have grappled with the ongoing challenge of delivering accurate information precisely when and where it is needed to enable better decision-making.

This enduring issue emphasises the urgent need for a transformative approach—one that seamlessly integrates digital innovation with cultural transformation.

The art and science of delivering physical outputs

Civil Engineering Works

These foundational elements—bridges, viaducts, tunnels, buildings etc.—tend to deal with **complicated problems**.

“For over three decades, major projects worldwide have grappled with the ongoing challenge of delivering accurate information precisely when and where it is needed to enable better decision-making.”

They involve:

- **Precise planning** based on physical laws, predictable outcomes, and tried-and-tested engineering principles.
- A focus on **semantics**: understanding and applying structural measurable requirements, material properties, and environmental factors to build safe, functional designs.
- **Judgmental decision-making** that relies on personal intuition and experience rather than data and analysis, making it inherently subjective, influenced by individual perspectives and groupthink.

The art and science of commissioning intended outcomes

Electro-Mechanical and Software Systems

This aspect, encompassing automated controls, power, signalling, communications systems, and more, often involves **complex problems** because:

- There are **emergent behaviours** and real-time interactions between mechanical, electrical, and software systems.
- These elements are grounded in **pragmatics**, focusing on adapting systems to **diverse contexts** and changing conditions, while ensuring seamless integration and optimising operational efficiency.

- Stakeholders and delivery organizations often require support to **address complex challenges** effectively. Understanding that problems differ in nature highlights the need for evidence-based decision-making to develop appropriate solutions.

The emphasis is on **adaptability and interoperability**, addressing challenges as they arise in dynamic, real-world environments and improving outcomes.

Bridging the Two: A Holistic Approach Driven by Ingenuity

Given the interplay between these components, an integrated approach is crucial to addressing both simple, straightforward problems (e.g., static structures) and complex, wicked challenges (e.g., automated operations in real-world contexts). Achieving success requires combining:

- **Semantics**: Establishing clear rules, data structures, and principles to guide foundational design and system requirements.
- **Pragmatics**: Ensuring seamless integration and operational synergy between designs, aligned with the principles of climate, people, places, and value, within a dynamic environment.

The core challenge lies in achieving smooth integration and sequencing of civil works, electro-mechanical systems, and automated components within an adaptive planning

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Podcast

Listen at: icxa.net/podcast



Get tips and best-practices for commissioning of your industrial plant process/energy system projects.

framework. This necessitates uniting multidisciplinary teams—business analysts, socio-technical experts, data engineers, and data aggregators—to pool their expertise and perspectives. The outcome is a collaborative approach with transparent and accountable decision-making, tailored to the appropriate **‘Level of Information Need’** at each phase of the project lifecycle.

The ICxA Global Commissioning Standard

The new ICxA Global Commissioning Standard introduces a top-down meta-process and a bottom-up knowledge validation framework for electro-mechanical and automated components that:

- **Bridges Silos:** Seamlessly connects workflows, data, and stakeholders across all stages of the project lifecycle, fostering continuity, enhancing cooperation, and enabling evidence-based decision-making from inception to completion.
- **Embeds Integration:** Advances beyond current paradigms by promoting a holistic, value creation framework. Through unified datasets and advanced data aggregation, it effectively addresses complex challenges.
- **Provides a Unified Vision:** Establishes a cohesive information ecosystem that surpasses basic interoperability, empowering stakeholders and delivery partners to align objectives, resolve intricate challenges, and optimize social, economic, and environmental outcomes throughout planning, development, and operational phases.

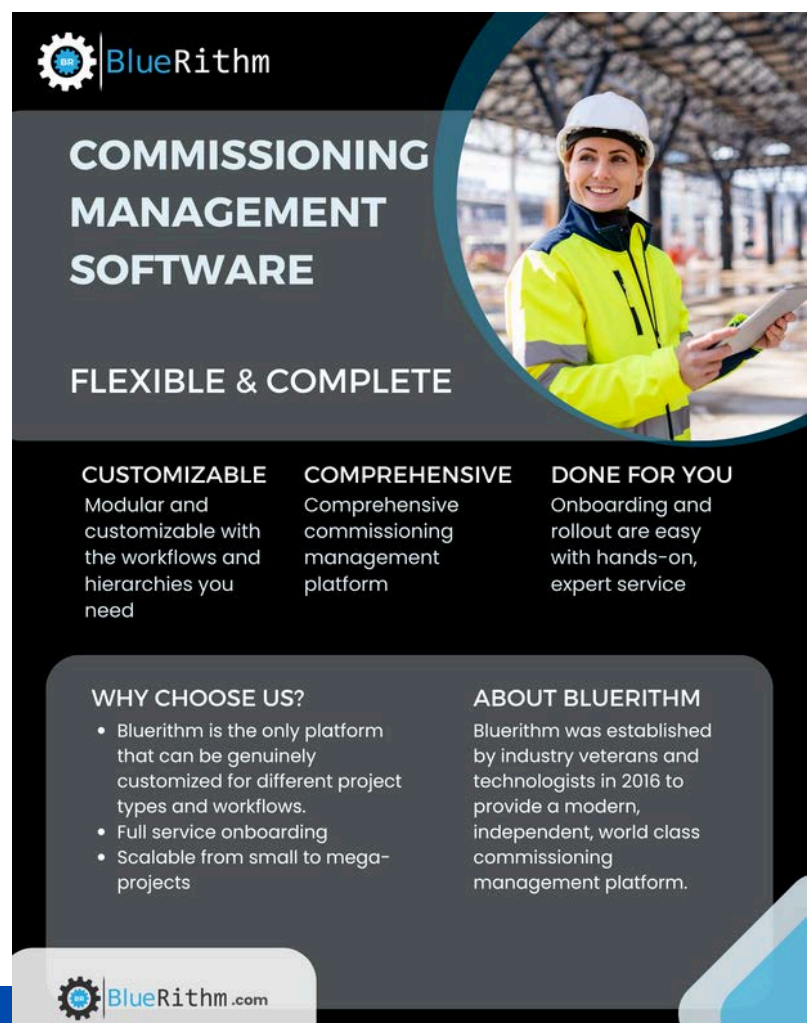
This forward-thinking approach transforms traditional area-based, construction-led delivery into a practical, commissioning-led alternative. By leveraging deeper integration

and advanced information management practices, it unlocks the full potential of data aggregation, streamlined workflows, and collaborative efforts.

Conclusion: Elevating the ISO 19650 Information Management Series

While the ISO 19650 series offer comprehensive guidance for adopting Building Information Modelling (BIM) Execution Plans in high-value civil engineering contracts, it falls short of addressing the complexities of electro-mechanical and automated industrial systems. This underscores the need for tailored guidance and best practices to navigate the unique challenges of dynamic, asset-intensive systems within regulated environments.

The **ISO 7817-1:2024** standard for the **Level of**



The advertisement features a circular inset image of a woman in a yellow safety vest and white hard hat, smiling and holding a tablet. The background is dark with white and light blue text. The BlueRithm logo is in the top left corner. The main headline reads 'COMMISSIONING MANAGEMENT SOFTWARE' and 'FLEXIBLE & COMPLETE'. Below this are three columns: 'CUSTOMIZABLE' (Modular and customizable with the workflows and hierarchies you need), 'COMPREHENSIVE' (Comprehensive commissioning management platform), and 'DONE FOR YOU' (Onboarding and rollout are easy with hands-on, expert service). At the bottom, there are two sections: 'WHY CHOOSE US?' (listing three benefits: only platform for genuine customization, full service onboarding, and scalability) and 'ABOUT BLUERITHM' (stating the company was established in 2016 by industry veterans and technologists to provide a modern, independent, world-class platform).

BlueRithm

COMMISSIONING MANAGEMENT SOFTWARE

FLEXIBLE & COMPLETE

CUSTOMIZABLE Modular and customizable with the workflows and hierarchies you need	COMPREHENSIVE Comprehensive commissioning management platform	DONE FOR YOU Onboarding and rollout are easy with hands-on, expert service
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WHY CHOOSE US?

- BlueRithm is the only platform that can be genuinely customized for different project types and workflows.
- Full service onboarding
- Scalable from small to mega-projects

ABOUT BLUERITHM

BlueRithm was established by industry veterans and technologists in 2016 to provide a modern, independent, world class commissioning management platform.

BlueRithm.com

Information Need provides a framework for consistently specifying information requirements and deliveries across the lifecycle of built assets, from planning to end-of-life. However, its scope does not extend to the specialised demands of electro-mechanical and automated systems, leaving a significant gap in its applicability.

The Industrial Commissioning Association's (ICxA) Global Commissioning Standard bridges this critical gap by embedding the **Commissioning Execution Plan (CEP)** at the heart of project lifecycles. Guided by a design principles-driven framework, the CEP redefines how capital infrastructure projects are planned, developed, and commissioned. Its systems-based lifecycle approach not only

addresses the intricate challenges of social, economic, and environmental systems but also establishes a robust foundation for specifying the **"Level of Information Need"**, ensuring evidence-based decision-making and accountability throughout.

By extending and complementing the ISO 19650 series, the CEP moves beyond traditional linear design and construction models, introducing a forward-thinking, commissioning-led alternative.

This holistic approach sets the stage for an **international standard tailored** to the demands of electro-mechanical and automated systems, driving sustainable and transformative outcomes.

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CONTRIBUTE YOUR COMMISSIONING KNOWLEDGE



Do you have a project update, valuable lessons learned, or insights on new technologies in commissioning? We're looking for articles to feature in our upcoming newsletter. It's a great way to showcase your work, share your expertise, and connect with our community!

Our readers love hearing about real-world experiences and fresh perspective.

Ready to contribute your knowledge? Send us your idea for an article at info@icxa.net and let's inspire and inform together!

CONTACT US!

 info@icxa.net

THE ROLE OF AI IN PROJECT DESIGN AND COMMISSIONING: A NEW PARADIGM

by Paul Turner, P.Eng., PMP

It's well recognized that the underperforming construction industry has failed to make the productivity gains that all other industries have achieved over the last several decades. The automotive industry, electronics and semiconductor industry, logistics and warehousing industry, financial services industry, telecommunications industry, and many others, have all achieved significant productivity gains, while the construction industry has remained stagnated.

There are many reasons for this that we won't get into, but that is finally about to change. If you're skeptical that the construction industry

is capable of meaningful change, then you need to understand the changes that are coming. Artificial intelligence (AI) is being discussed everywhere these days, but ignoring the obvious trends that are taking place will jeopardize your livelihood.

A recent report issued by METR, a non-profit organization based in Berkley, CA, shows the length of tasks that AI can do is doubling every 7 months, and this rate looks to be increasing.

What the report indicates is that there is a Moore's Law for AI Agents. This Agentic Transformation will transform how knowledge work is done by AI Agents, particularly the detailed engineering design phase of projects.

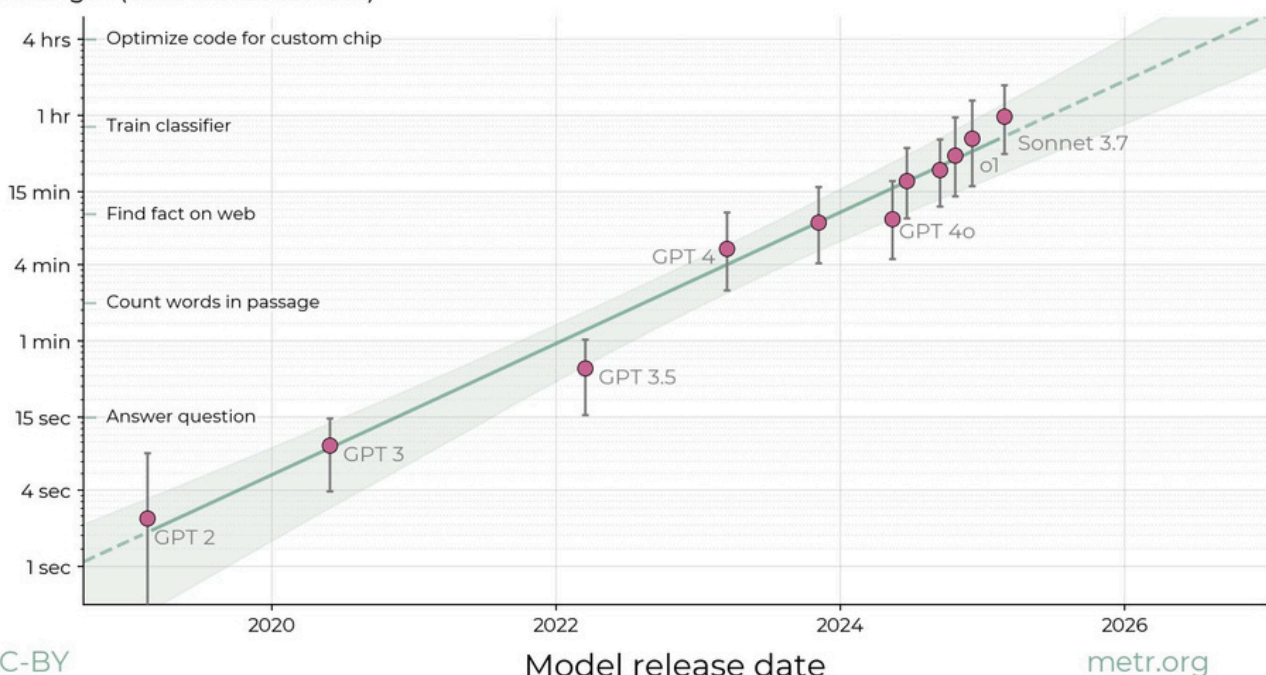
The chart below is plotted on a logarithmic scale. When plotted on a linear scale, you can see the exponential of this Agentic Transformation.

Source: METR (<https://metr.org/blog/2025-03-19-measuring-ai-ability-to-complete-long-tasks/>)

The length of tasks AIs can do is doubling every 7 months



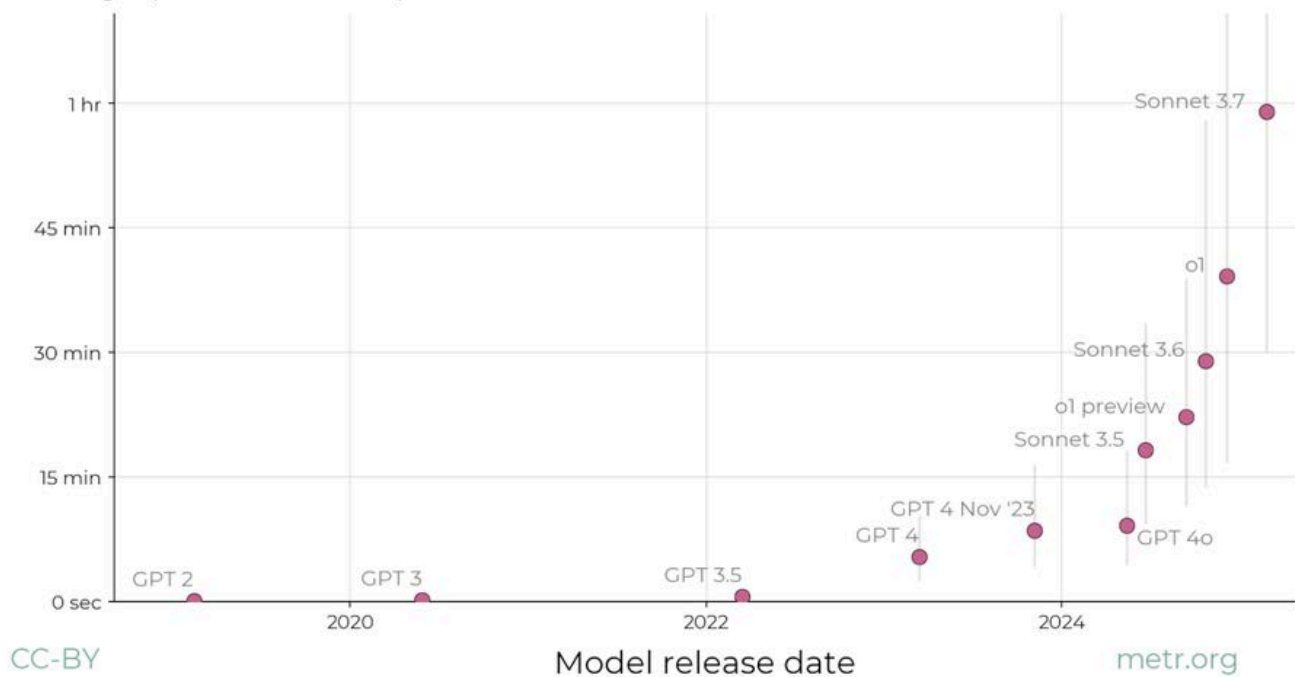
Task length (at 50% success rate)



The length of tasks AIs can do is doubling every 7 months



Task length (at 50% success rate)



Source: METR (<https://metr.org/blog/2025-03-19-measuring-ai-ability-to-complete-long-tasks/>)

Humans are not very good at estimating the impact of exponential change.

Some examples are the transition from horses to automobiles or the impact on cell networks during the adoption of cell phones.

The exponential adoption of mobile devices crippled cell networks in the early 2000s as telecom companies scrambled to keep up with the demand.

Moore's Law has held up for over 4 decades for the number of transistors on a chip, and it is not unreasonable for this exponential trend that is happening right now to continue at an unprecedented rate.

The METR report estimates that day long work tasks will be automatable by the end of 2027. If you think AI is a bubble that is about to burst and you've been trying to ignore the media hype, think again.

So What Does this Mean for Projects?

It's not a question of IF this transformation is going to have an impact on projects – the question is WHEN will the capabilities be good enough to leverage for knowledge work on projects.

Obviously a 50% success rate is not acceptable, but this is only going to improve. Once the success rate far exceeds the natural human error rate on projects, this will make AI Agents the obvious choice for speed, efficiency and quality of engineering tasks.

The success rate of AI systems for software engineering has already surpassed human capabilities.

It is estimated that 90% of code will be generated by AI in 6 months, and nearly all code will be written by AI by the end of 2025. The change is happening now with software engineering, and other disciplines will soon follow.

Instead of having a team of 10 electrical engineers working on a project, leadership will have a team of a thousand or more AI Agents specialized in electrical engineering, able to promptly produce all aspects of specialized engineering tasks with improved accuracy and in a fraction of the time.

Human leadership will still be required – the strategic leadership that can solve problems, lead large teams, and direct team efforts in the right direction to create great things. But the knowledge workers responsible to do the tasks under human leadership will quickly be replaced by specialized AI Agents that can exceed the performance of the doers.

There is a secondary trend that is taking place as well. As the capabilities of AI Agents is increasing, the cost of intelligence is going to zero. With infinite access to intelligence at a decreasing cost, this will revolutionize how projects are undertaken.

While project detailed design and engineering can take 3 years for example, this can be reduced down to 3 weeks, shortening the length of projects, eliminating any unknowns prior to the start of construction, with every RFI already answered before projects even start, driving the risk of undertaking projects as close to zero as possible.

By front-loading detailed design with AI, and concluding with a rigorous commissioning phase, the construction process can become more streamlined and efficient.

AI-Driven Design at the Outset

At the beginning of projects, AI agents will take the helm in generating all preliminary and detailed design packages in a fraction of the time.

These AI systems can analyze vast

datasets, simulate scenarios, and optimize design elements, ensuring that every detail is defined before construction begins.

Think of this like a digital rehearsal – every aspect of the project is fully defined, there is no ambiguity, and as much of the risk has been eliminated right from the start. Several project configurations can be studied and analyzed before any financial commitment is made to proceed. Projects are fully simulated, much more than the current 3D models are capable of today, to also include functionality of the systems, verification of commissionability and operability, with all PLC logic control files generated and fully tested in advance, all before any financial commitments to the project are made.

With AI-Driven Digital Twins, it will be possible

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ICA Global Commissioning Standard, Procurement Best-Practices, Lessons Learned Repositories, To Complete Commissioning as Efficiently as Possible

Benefits of joining the Industrial Commissioning Association

-  Apply commissioning best-practices to your projects
-  Get management buy-in for commissioning
-  Apply lessons learned from other projects
-  Select the best software for your projects
-  Follow a roadmap to complete commissioning
-  Be part of a community to get support along your CSU journey

 **To become a member**
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to represent the entire project, allowing for real-time simulation and optimization throughout the project lifecycle.

These dynamic models can predict outcomes from commissioning, optimize processes, and identify potential issues before they occur, well before any financial commitment is made to proceed with building the project.

The possibilities are endless with Generative Design, where AI is used to explore countless design alternatives rapidly, finding the most efficient, cost-effective, and sustainable solutions that humans take much longer to design and might not even consider.

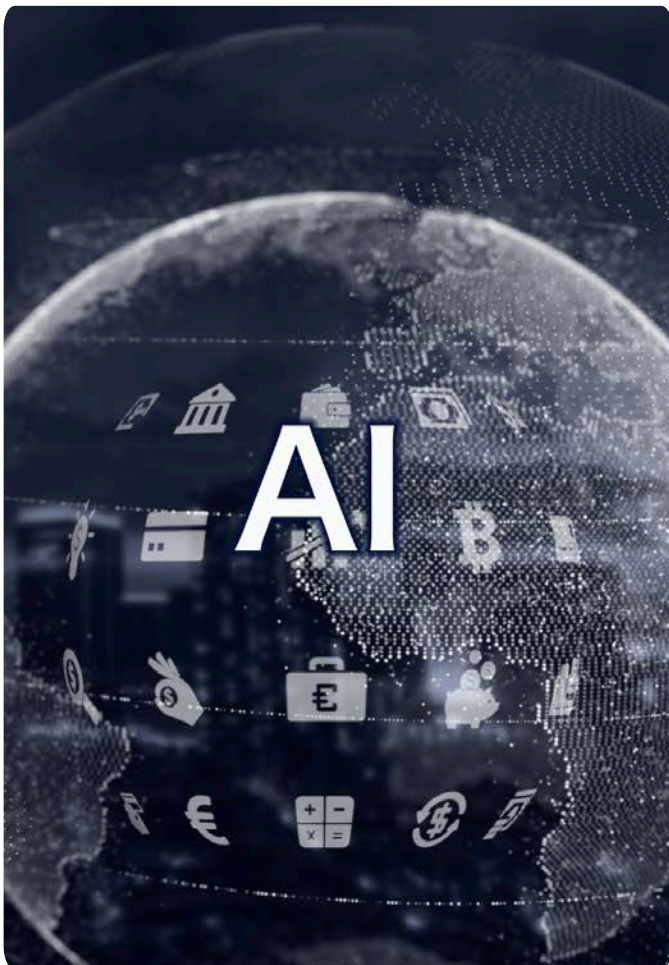
The reduction of the engineering phase from 3 years to 3 weeks gives all project stakeholders the ability to fully understand all aspects of the project before starting, significantly

reducing risk, and having an incredible impact on project execution.

Construction: The Execution Phase

With a complete and detailed design in place, the construction phase becomes a matter of execution.

Contractors can focus on building according to the precise specifications provided by the AI Agent engineering and design team, reducing the likelihood of errors, rework, and delays. Every big and small aspect of engineering is defined in advance, every RFI is answered in advance, all installation details are fully defined, with no piece of information missing. There are no changes issued on the project, since everything is studied in advance and perfected, making it much easier to focus on construction execution and avoiding any



“Two quarters from now, the AI Agents you haven’t hired yet will be 4 times as capable. If you ignore the trends shown in the METR report continues, you’re left behind pretty quickly.[...] If you have not started to determine your AI Agent strategy on projects, the best time to do that was yesterday. The second best time is today.”

changes that typically slow progress of installation.

Project delivery strategies are significantly altered.

The original concept of EPC contracts was to allow engineering design groups to work more closely with construction groups for better collaboration.

The EPC project delivery strategy replaced the design-bid-build model because there were too many unknowns with incomplete engineering to bid the work and too many opportunities for claims when things are missed in the design.

However, AI Agentic design eliminates the need for the EPC contract structure. When all of the detailed engineering design is completed before any financial commitments

are made for the project and well before construction starts, project delivery strategies revert back to design-bid-build delivery models, giving control back to project owners. Construction-only contracts are awarded with every design detailed and every work package fully defined, making it easier for contractors to bid on the work and reducing risk for project owners and contractors.

With all engineering fully defined in advance, contractors have everything they need to be fully informed on how to start and how to finish installation to align with commissioning and startup sequences as systems are completed.

This completely eliminates the claims-games that often occur on projects. The construction groups focused on quality and precise execution will thrive in this environment.



Commissioning Project Audits

Optimize Execution
Implement a Strategic Commissioning Framework
Ensure Seamless Project Handover



Strategic Commissioning Starts with Early Risk Identification

What is a Commissioning Project Audit?

A Commissioning Project Audit is a structured evaluation designed to align commissioning with project management, contractual execution, and digital integration. We assess:

- ✔ Commissioning Process Integration
- ✔ Strategic Commissioning Leadership Alignment
- ✔ Digital Commissioning & Data Integration
- ✔ Contractual Commissioning Implementation
- ✔ Risk Exposure & Compliance Readiness

Who Benefits from a Commissioning Project Audit?

Several industry professionals can greatly benefit from these services.

- ✔ Project Owners & Developers
- ✔ EPC Firms & Contractors
- ✔ Commissioning Leaders & Managers
- ✔ Digital Transformation & Technology Teams
- ✔ Legal & Contract Management Teams

What's Included in a Commissioning Project Audit?

Our audit provides a comprehensive, actionable risk assessment covering:

- ✔ Project Management & Commissioning Integration
- ✔ Strategic Commissioning Leadership Evaluation
- ✔ Digitalization & Data Integration Assessment
- ✔ Contractual Implementation & Compliance Review
- ✔ Corrective Action Roadmap
- ✔ Expert Consultation & Support

To book a Commissioning Audit Consultation

icxa.net/audit

The construction groups with business models built on claims negotiation will quickly have to adapt or go out of business.

Elimination of the threat of claims puts the focus on construction execution, and the groups that adopt this new paradigm will thrive, while others fade away, scrubbing the construction industry of the under-performers.

The entire claims industry disappears, making the only path forward to be a focus on delivering high quality systems on-time and on-budget.

Take this one step further, and eventually humanoid robotics will be able to do several tasks on-site as well.

We'll leave this for a future discussion, but it is not unreasonable to think that AI and robotics advancements will be able to handle repetitive tasks such as tying rebar or pouring concrete, while being managed by specialized construction managers capable of harnessing these new technologies.

Equipment Procurement Supply Chain

Human error in the supply chain is an issue and getting equipment delivered to site when needed must improve. Several other industries have achieved efficiencies in supply chains, and it is reasonable that AI can revolutionize supply chain processes for construction in several ways:

- **AI-Managed Vendor Networks:** Create a self-regulating vendor ecosystem where AI continuously evaluates and selects vendors based on performance metrics, compliance, and reliability, automatically adjusting to ensure optimal supply chain performance. Suppliers that embrace efficiencies will be recognized and awarded work, while others that struggle and are unable to improve will get left behind.

A focus on performance and efficiency will be rewarded.

- **AI-Driven Logistics Orchestration:** Utilize AI to autonomously manage logistics, from warehousing to transportation, coordinating the entire flow of materials with minimal human involvement. A production-based supply chain delivering to the elite construction groups capable of integrating improved supply logistics guarantees no late deliveries to site.
- **AI-Powered Hyper-Optimization Platforms:** Develop platforms that not only predict but continuously optimize the supply chain in real-time, using advanced algorithms to dynamically adjust procurement schedules based on project progress, vendor performance, and global supply chain conditions.
- **Blockchain-Integrated AI Contracts:**

COMMISSIONING LEADERSHIP PROGRAMS

INTERMEDIATE AND ADVANCED PLANNING FRAMEWORKS FOR COMMISSIONING

Intermediate and Advanced courses, aligned with the ICA Global Commissioning Standard, provide actionable training to enhance your leadership capabilities.

- ✓ **Learn to Manage the Big Picture**

Plan schedules, budgets, and resources while ensuring commissioning supports project success.

- ✓ **Master Stakeholder Management**

Confidently manage client expectations, contractor performance, and team alignment.

- ✓ **Earn Industry Recognition**

Demonstrate your expertise and achieve commissioning excellence.

Utilize smart contracts on blockchain that are managed by AI, ensuring automatic execution and enforcement of terms, leading to increased transparency and accountability across the supply chain.

Commissioning: Engineering Verification and Compliance

Commissioning will finally become a much more prominent aspect of projects, since the outputs of AI Generative Design systems must be verified by qualified commissioning experts to ensure systems align with the original AI-driven design.

The focus right at the beginning of projects, before financial commitments are made will be to confirm that the AI generated design fully functions in the end.

Digital rehearsals completed at the beginning of projects will be verified once permanent installations are complete to verify system are suitable for decades of reliable operation.

The digital thread of robust commissioning processes spanning the entire duration of projects ensures the data-rich environment created during AI design is utilized throughout the project and integrated into asset management systems for use during routine operation and maintenance.

Conclusion

This new paradigm, with AI agents defining the detailed design and a rigorous commissioning phase verifying compliance, will transform the construction industry. By sandwiching the construction phase between these two critical bookends, projects achieve much higher accuracy, efficiency, and reliability, paving the way for a future where AI and human expertise work hand in hand to deliver superior project outcomes.

For companies trying to figure out what your AI Agent strategy is for projects, it means by the time you report on your next quarterly results, the capability of the AI Agents you are not yet working with will have doubled. Two quarters from now, the AI Agents you haven't hired yet will be 4 times as capable. If you ignore the trends shown in the METR report continues, you're left behind pretty quickly.

If we only get a fraction of these benefits, this is still a civilization changing trend, and a trend that the construction industry cannot ignore. These AI Agent capabilities, for which you are skeptical, are improving at an extraordinary rate. As mentioned earlier, humans are historically unbelievably bad at thinking in terms of exponentials.

If you have not started to determine your AI Agent strategy on projects, the best time to do that was yesterday. The second best time is today.

So don't ignore the trends that this data clearly presents.

The stagnant construction industry must finally adapt, and several groups will be forced to adapt while kicking and screaming like a toddler refusing to eat their Cheerios. Even if you prefer things to stay the way they've always been, these trends cannot be ignored.

Getting stuck on something as simple as terminology is a sure way to get left behind. When there are no more EPC contracts and contractors are expected to perform, there is no longer an opportunity to count on making up for inefficiencies with claims at the end. Those that embrace these changes have a significant opportunity to thrive in the world's largest industry of construction, and those that continue to refuse will quickly be forced to find a new line of work.

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SENIOR CONTROLS ENGINEER



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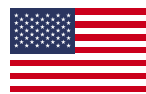
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PRESIDENT, GENERAL MANAGER,
BOARD OF DIRECTORS GATE ENERGY

CONTRACTS AS A TOOL TO FINISH PROJECTS

by Paul Turner, P.Eng., PMP

When we look at most contracts, they're usually pretty light on commissioning details. I'm not referring to the technical details of commissioning. What a lot of contracts are missing are the commercial and project management aspects of commissioning.

When contracts are being prepared, it is natural for everyone's focus to be on getting the work started – awarding contracts so groups can mobilize to site and get started with the work.

It's challenging for the project team's mindset to be thinking about commissioning several years in the future.

But when contracts are only being used to start the work, there is a lot of risk that remains with no definition of how to finish the work. And finishing is the most important part of projects, right?

The contractual implementation of the commissioning process is often overlooked—something to be figured out once construction is nearing completion instead of defined upfront in contracts. The consequences of this oversight are profound: scope gaps, disputes over responsibilities, delayed start-ups, unverified system performance, and ultimately, failure to meet project

expectations. As you know, if it's not in the contract, it's not going to happen.

To address this industry gap, the Industrial Commissioning Association is developing **ICA-010: Contractual Implementation of the Industrial Commissioning Process**, a comprehensive standard for integrating commissioning obligations into the DNA of project contracts. This guide outlines how to structure contracts that enforce accountability, define clear commissioning roles, and link payment milestones to meaningful progress in system testing and validation.

At its core, ICA-010 defines the critical link between systems-based construction completion to align with the staged-gate process of system commissioning and startup. From the earliest stages of a project, commissioning requirements should be explicitly stated in design, engineering, procurement, construction, and vendor agreements. Every stakeholder—owners, EPC contractors, vendors, suppliers, and field teams—must understand their responsibilities and the consequences of non-compliance. Failure to do so can result in equipment arriving at site without proper FAT or IFAT testing, incomplete system handovers from construction groups to commissioning groups, and misaligned understandings of what success looks like during commissioning. When the critical transition from area-based construction to systems-based completions remains undefined in contracts, then there is little chance that construction groups and commissioning groups are aligned for smooth completions.

ICA-010 walks through how commissioning should be adapted to various project delivery models. For instance, in an **EPC contract**

where the contractor is also the original equipment manufacturer (OEM), commissioning is often their responsibility, but startup is not.

In contrast, **EPCC models** contractually bind the contractor to deliver not just construction, but the execution of commissioning itself—including static checks, functional testing, and system-level verification. Models such as Design-Build (DB) and Construction Management (CM) require the owner to assign commissioning separately, making early contractual alignment even more critical. Integrated Project Delivery (IPD) and BOOT arrangements bring another level of complexity, demanding shared risk frameworks or long-term performance accountability that extend well beyond construction turnover.

To prevent miscommunication and misinterpretation, ICA-010 also emphasizes the use of standardized commissioning terminology. Terms like "static commissioning," "functional testing," "system-level testing," and "performance verification" must be defined in contractual language, leaving no room for ambiguity. Without this clarity, it becomes easy for vendors and contractors to claim they've fulfilled their scope while leaving key commissioning activities incomplete.

When writing contracts, it is best to use the ICA Global Commissioning Standard as your guide for a standardized and consistent approach to commissioning. When project teams write better contracts with the commercial and project management aspects of the ICA Global Commissioning Standard as a reference, projects have better outcomes.

If commissioning isn't accounted for in equipment procurement contracts, issues

quickly arise when equipment shows up untested, undocumented, or unsupported. Once it's noticed that FAT or IFAT were missed in equipment contracts, it's often too late to get this added – the change order is too expensive and nobody wants to pay for it, instead suggesting testing can take place at site. All this does though is kick the can down the road and add more risk to the end of your project during critical path commissioning activities. Do this too many times and you're guaranteed to experience expensive delays.

Instead, equipment procurement contracts must stipulate that FAT and Integrated FAT (IFAT) are conducted before shipping, with owner and commissioning team representatives having the right to witness and approve these tests. The inclusion of terms for Site Acceptance Testing (SAT), commissioning spares, and support personnel are no longer optional—they are non-negotiable.

Crucially, ICA-010 calls for payment milestones that reflect the reality of project execution. Payments should not be released simply because construction is complete. Instead, progress payments must be linked to commissioning milestones—such as static commissioning completion, dynamic commissioning completion, performance verification, and successful trial operation. Final handover and payment should only occur once the Final Commissioning Certificate is issued, confirming that the system has met all contractual performance criteria. This keeps all parties aligned and financially motivated to see commissioning through to completion.

Beyond the legal and technical language, ICA-010 offers a clear message: projects must be started with a commissioning-first approach

beginning with contracts—not as an activity to be determined as construction is completed. The consequences of poorly written contracts is not theoretical, and is the cause of a lot of problems on projects when construction is given all the attention with commissioning as an afterthought. In contrast, successful projects implement holdbacks, define trial operation restart conditions, and establish vendor commissioning obligations that ensure systems are delivered tested, functional, and ready to perform.

In today's high-risk, high-cost industrial project environment, the days of poorly-written contracts are over. Roll up your sleeves and get involved in project procurement processes to ensure legal and purchasing groups get the commissioning support and guidance they need to properly structure contracts. Don't wait to be asked – offer your input to

help these groups with the details they are not familiar with to be added to contracts.

Owners, developers, and project managers can no longer afford to discover commissioning problems after the system is built.

They need your commissioning expertise to write enforceable contract terms that ensure commissioning is not only planned—but performed, validated, and documented, for a smooth completion of projects.

For those looking to take the next step, watch for the release of **ICA-010: Contractual Implementation of the Commissioning Process**. This is not just a best-practice guide—it's a call to action. Projects that succeed in commissioning succeed in operations. And that success begins long before the first test—it begins with contracts.

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