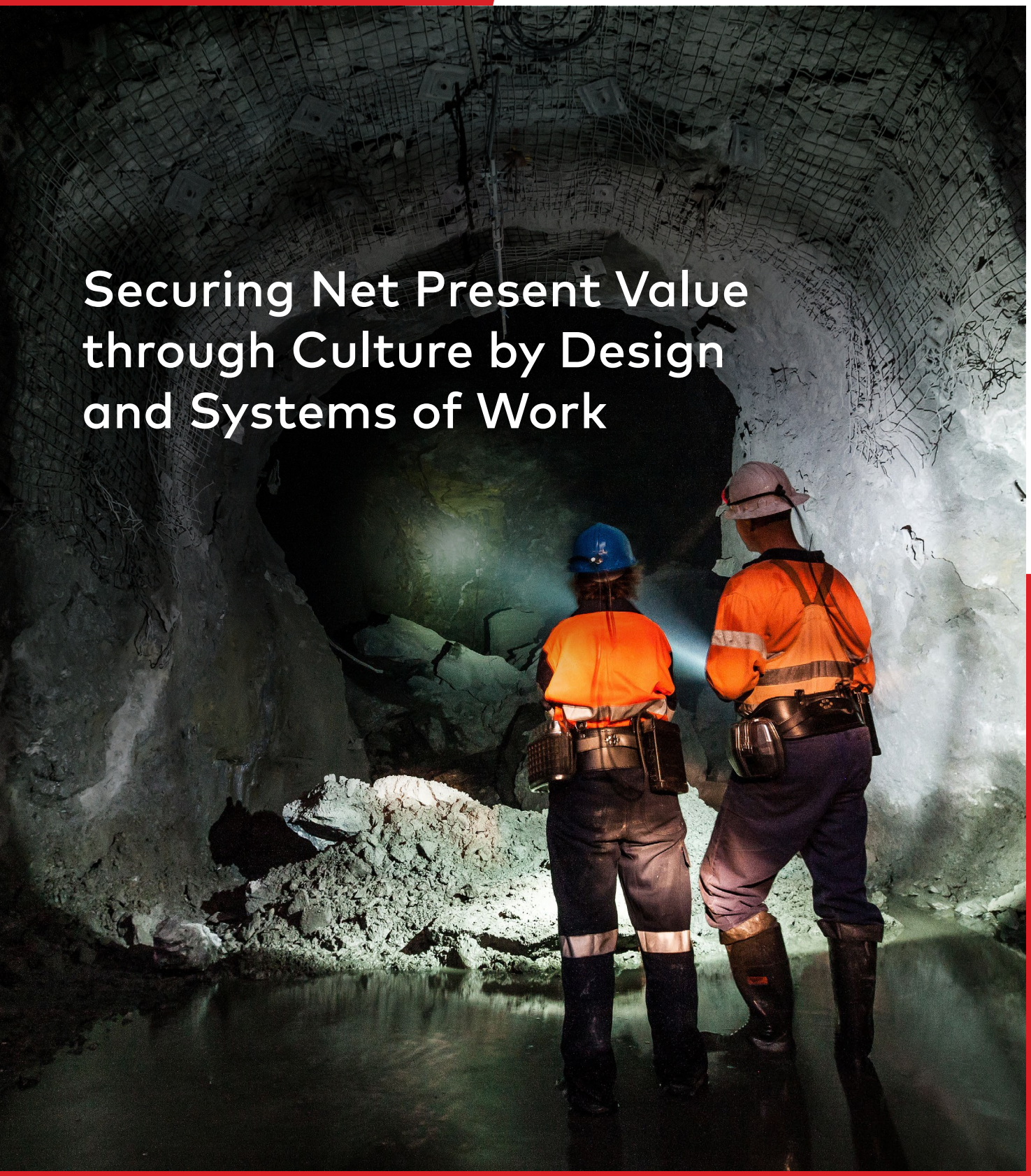
Securing Net Present Value through Culture by Design and Systems of Work



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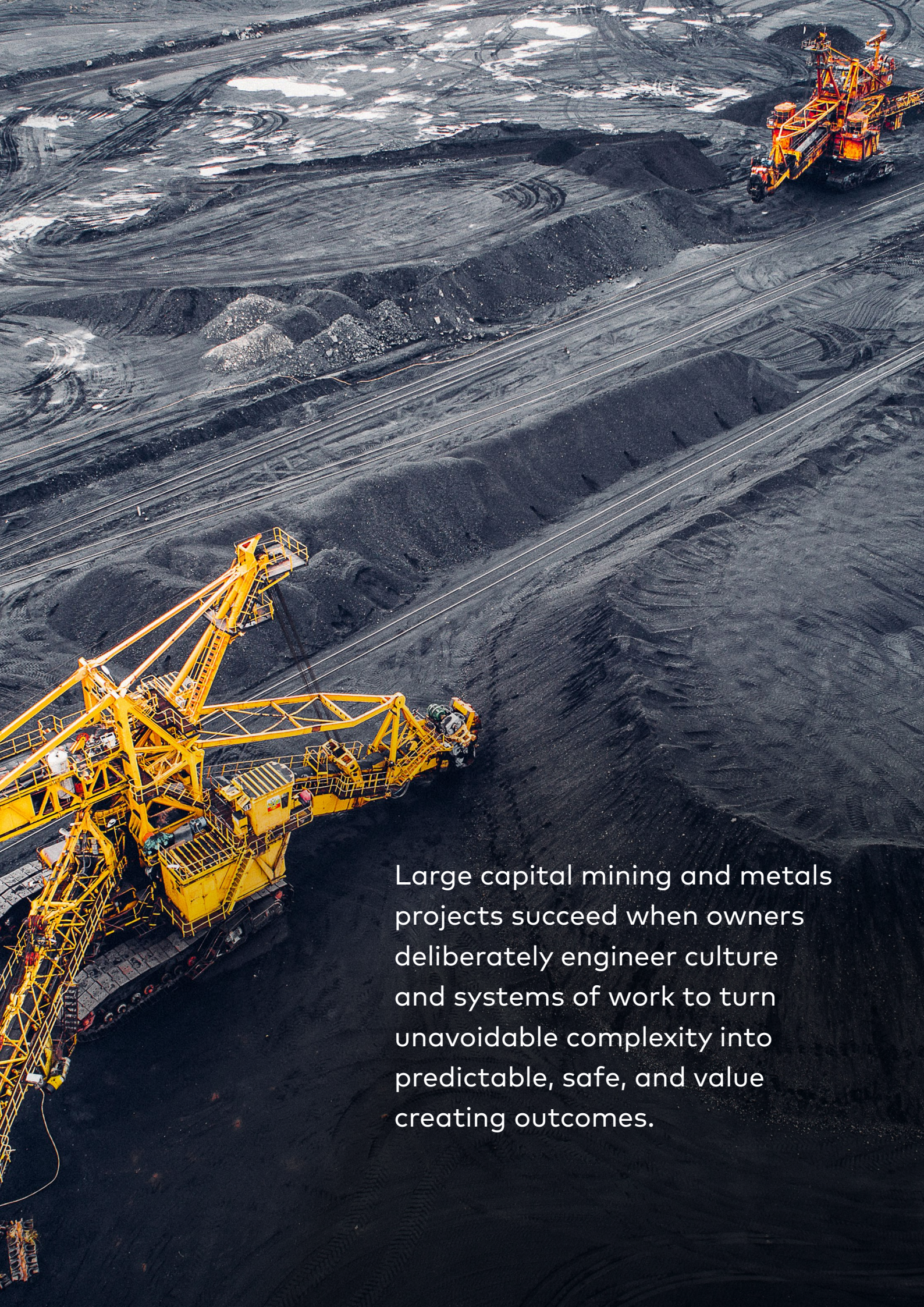


Large capital mining and metals projects succeed when owners deliberately engineer culture and systems of work to turn unavoidable complexity into predictable, safe, and value creating outcomes.

From Complexity to Consistency:

A New Approach to Project Delivery

Large capital mining and metals projects—including new mines, expansions, processing facilities, tailings infrastructure, and supporting logistics—are among the most complex and capital-intensive investments in the industrial landscape. When executed well, they unlock long term value, secure supply for critical minerals, and strengthen regional economies.

Industry evidence consistently shows, however, that delivering these projects on plan is the exception rather than the norm.

> **Recent global analysis of mining and metals and metals projects indicates that approximately 83% of major mining and metals projects experience material cost or schedule overruns, with average capital expenditure growth exceeding 40% and schedule delays of 20–30%.**

Performance deteriorates further as scale increases. For mining and metals projects with capital expenditures greater than $1 billion, average cost overruns rise to nearly 80% above original budgets, while schedule durations extend by more than 50%.

These findings align with broader research on large capital investments across capital intensive industries. Studies of thousands of major projects show that more than two thirds exceed approved budgets, and over 70% miss scheduled completion dates, despite decades of advances in project controls and engineering tools. Mining projects are particularly exposed due to remote locations, constrained labor markets, evolving ore bodies, regulatory complexity, and heightened environmental and social performance expectations.

Importantly, these outcomes are not the result of isolated failures or poor execution on individual projects. They reflect a repeatable pattern that signals a systemic opportunity. In other high stakes environments such as acquisitions, product launches, or market entry organizations deliberately engineer operating models to manage complexity upfront. Large capital mining and metals projects can benefit from the same discipline.

> **Capital mining and metals projects do not succeed by chance; they succeed by design.**

dss+ has developed a proven method to help mining and metals project owners break this pattern and achieve predictable outcomes while avoiding unnecessary cost escalation and schedule volatility. At scale, efficiency does not naturally emerge from size it must be deliberately designed. Large capital mining and metals projects are not simply larger builds. They are complex systems shaped by interdependent organizational, contractual, technical, regulatory, and operational forces.

When that complexity is left unmanaged, fragmented project cultures and disconnected systems of work struggle to keep pace, leading to inefficiencies, rework, and overruns. When complexity is intentionally engineered, it becomes a source of control, resilience, and sustained performance.

Accountability in Mining and Metals Projects Begins with an Integrated Cultural Strategy

Integrated planning on mining and metals projects often collapses under the weight of competing pressures. EPCMs, contractors, OEMs, and operations teams pursue legitimate local objectives. Protecting production, controlling costs, and managing risk while the overall project system can drift out of alignment.

In mining environments, constrained resources such as skilled labor, specialized equipment, laydown space, access to shafts, haul roads, or processing circuits become negotiation points rather than system optimized assets. Safety priorities, production pressures, and capital execution goals compete rather than reinforce one another.

Challenges inevitably arise at contract interfaces, during phase transitions (engineering to construction, construction to commissioning), and at discipline handoffs. When accountability is unclear, issues linger. Delays trigger rework, rework causes congestion, congestion erodes productivity, and costs accelerate. As projects extend, safety exposure grows, regulatory risk increases, and stakeholder confidence erodes.

These outcomes are not driven by a lack of competence or commitment. They are the predictable result of hidden complexity in high risk, high consequence mining environments.

Every additional contractor, joint venture partner, regulator, approval gate, or reporting layer adds coordination overhead. Even experienced owner teams can find decision cycles stretching from days to weeks or months, slowing momentum and amplifying execution risk.

Turning Mining Complexity into Advantage with Culture by Design

dss+ addresses these challenges through **Culture by Design**, supported by **Defined Systems of Work**, engineered specifically for large capital mining and metals projects.

Mining and metals projects do not struggle because they are technically or geologically complex. They struggle when culture is allowed to form by default. At scale, culture becomes the operating system. When culture rewards optimism over facts, avoids early reporting of bad news, or prioritizes local milestones over system throughput, schedule and budget erosion become inevitable.

Culture by Design: A Critical Mining and Metals Advantage

Culture by Design creates clarity and alignment by:

- Defining clear owner led values for safety, delivery, and operational readiness
- Codifying expected behaviors across contractors and project teams
- Establishing measurable expectations tied to system performance
- Aligning leadership from corporate offices to remote site execution

Rather than relying on informal norms, leaders intentionally shape how the mining and metals project operates day to day. These expectations are reinforced through Systems of Work tailored to mining and metals realities—shift handovers, change management, permitting, commissioning readiness, and operational integration.

The result is a predictable, resilient culture embedded before construction and commissioning begin.

High performing mining and metals projects deliberately design culture to support disciplined execution:

- Fact based performance metrics outweigh progress optics
- Safety, production readiness, and capital discipline reinforce one another
- Early identification of constraints replaces late stage recovery efforts
- Teams are recognized for surfacing risk, not masking it
- Owner, EPCM, contractor, and operations silos are replaced with shared outcomes

Defined Systems of Work for Construction Execution Excellence

dss+ Engineered Culture by Design is sustained by robust Systems of Work that replace reactive firefighting with managed, repeatable outcomes.

Successful large capital mining and metals projects operate with:

- A single integrated, owner controlled master plan
- Proactive identification of construction and commissioning constraints, where constraints are identified, mitigated or solved during the integrated planning process
- Supervisors are not burdened with solving complex interdisciplinary problems, they focus their teams on safe and disciplined execution
- Progress measured by physical advancement and constraint removal
- Decision latency treated as a tangible cost
- Clear escalation paths that move faster than field execution
- Incentives aligned to shared milestones, shared risk, and overall throughput

When systems are weak, coordination dominates and frontline supervisors are overwhelmed. When systems are strong, complex technical and logistical challenges are absorbed by the planning system and resolved before they disrupt execution.

dss+ builds Defined Systems of Work by:

- Mapping engineering, procurement, construction, and commissioning interfaces
- Establishing appropriate governance and decision frameworks
- Formalizing structured routines from feasibility through handover to operations

Start Early: Mining and Metals Projects Benefit Most from Early Integration

For mining and metals projects, Culture by Design and Systems of Work deliver the most value when conceptually designed. during the feasibility or pre-FEED stage, before final decisions are made on scope, execution strategy, and contracting.

Early integration allows owners to anchor project culture in their safety philosophy, operational model, ESG commitments, and long term mining and metals strategy. This alignment ensures that capital execution supports production readiness rather than competing with it.

Projects that enter FEED and EPC with a unified cultural and operational baseline experience fewer changes, optimized construction, and lower safety and schedule risk. Early operational readiness ensures that mine and plant ramp-up schedules are met, protecting and even enhancing investment returns. Waiting until execution to address culture and systems makes correction slower, costlier, and more disruptive especially in remote or high hazard mining environments.

Tailored Solutions for Mining and Metals Capital Projects

dss+ adapts Culture by Design and Systems of Work to each Mining and Metals project by:

- Implementing integrated planning systems across owner, EPCM, and contractors
- Develop onboarding packages that clearly define the required behaviors needed to achieve the target safety, management, and operational excellence culture.
- Establishing best practice routines from early works through commissioning
- Using war rooms to track safety, progress, constraints, and readiness metrics
- Install execution management and critical risk management tools as part of the Management Operating System (MOS) at the point of execution

Early adoption delivers:

- Clear expectations before contractors mobilize to site
- Unified ways of working, measurements creating "one version of the truth," and defined behaviors that will drive and create the expected project culture
- Seamless integration of safety, execution, and operations readiness
- A strong owner's team capable of holding stakeholders accountable
- Reduced execution risk, exceptional safety performance and significant capital and schedule savings

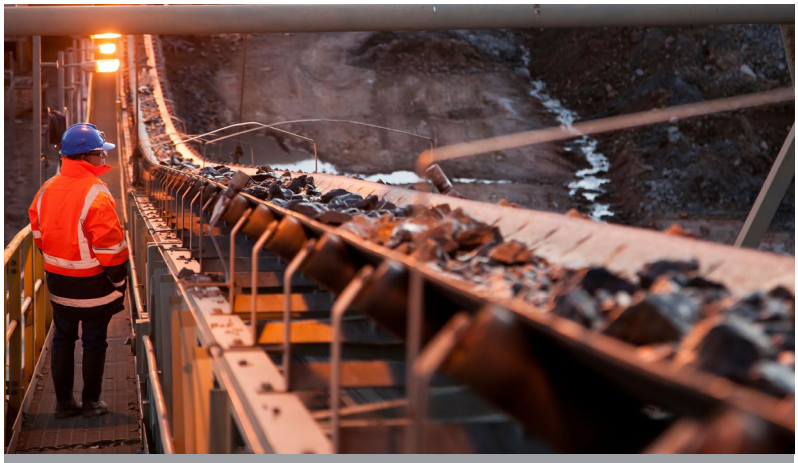
Delivering Accountability Across the Mining and Metals Project Lifecycle

As mining and metals projects progress, Culture by Design and Systems of Work mature from risk mitigation tools into performance drivers by optimizing labor deployment, equipment utilization, supply chain reliability, and production ramp up. This maturity enables leadership to protect the critical path, manage float strategically, and consistently achieve key milestones, while maintaining safety and community trust.

The Future of Large Capital Mining and Metals Projects

The next generation of successful mining and metals projects will be led by owners who act early, deliberately engineer culture, and install disciplined Systems of Work before execution begins.

dss+ helps mining and metals project owners convert complexity into control, ensuring scale becomes an advantage, not a liability, and delivering the full Net Present Value of their investments.



Why dss+ Is the Partner of Choice

Large capital projects do not succeed by chance. They succeed by design. Owners who deliver predictable outcomes understand that culture and execution systems are not afterthoughts, but the foundation that governs performance at scale.

dss+ helps project owners build that foundation. Unlike traditional advisors who focus on controls or intervene once problems escalate, dss+ integrates Culture by Design and Defined Systems of Work into an execution ready operating model that addresses the root cause of underperformance: hidden and unmanaged complexity.

By engaging early during feasibility, pre FEED, and FEED dss+ embeds clear behaviors, accountability, and systems before construction execution begins. When contractors mobilize, expectations are aligned, decision paths are clear, and the system is already working.

With experience across capital intensive industries and an owner centric, hands on delivery model, dss+ converts scale from a risk into an advantage. We replace reactive recovery with predictable performance. We work with the owners team by aligning culture, incentives, and systems around shared outcomes.

The next generation of successful large capital projects will be led by owners who design success upfront. dss+ is the partner that will work with owners' teams to make it happen.

Footnotes

1. ***McKinsey & Company, The Capex Crystal Ball: Beating the Odds in Mining and Metals Project Delivery*** (New York: McKinsey & Company, 2024).
   This global analysis of mining and metals capital projects finds that approximately 83% of major mining and metals projects experience significant cost or schedule overruns, with average capital expenditure growth exceeding 40% and schedule delays of 20–30%. The study further reports that for projects with capital expenditures greater than US$1 billion, average cost overruns increase to nearly 80%, while schedule durations extend by more than 50%.
   https://www.mckinsey.com/industries/metals-and-mining/our-insights/the-capex-crystal-ball-beating-the-odds-in-mining-project-delivery

2. ***Bent Flyvbjerg, Survival of the Unfittest: Why the Worst Infrastructure Gets Built— and What We Can Do About It*** (Oxford: Oxford University Press, 2014).
   Flyvbjerg's research on large capital projects demonstrates that performance degrades as project scale increases, identifying a structural relationship between scale, complexity, and escalating cost and schedule risk.

3. ***McKinsey & Company, The Construction Productivity Imperative*** (New York: McKinsey & Company, 2016; updated analyses cited in subsequent capital projects research).
   Based on reviews of thousands of large capital investments across capital intensive industries, McKinsey reports that more than two thirds of major projects exceed approved budgets and over 70% fail to meet scheduled completion dates, despite advances in engineering, project controls, and digital tools.
   https://www.mckinsey.com/business-functions/operations/our-insights/the-construction-productivity-imperative

4. ***Bent Flyvbjerg, Alexander Budzier, and Daniel Lunn, The Iron Law of Megaprojects, Saïd Business School, University of Oxford, 2015–2020***.
   An analysis of over 16,000 large projects globally shows that only 8–10% achieve both cost and schedule targets, establishing cost overruns and delays as systemic rather than episodic failures.

5. ***Ernst & Young (EY), How Rethinking Project Management Can Boost Mining's Capital Productivity*** (London: EY, 2021).
   In a review of 192 mining and metals projects exceeding US$1 billion, EY found that 64% suffered cost or schedule overruns, citing remote locations, constrained labor markets, geological uncertainty, permitting complexity, and heightened ESG expectations as primary contributors.
   https://www.ey.com/en_gl/mining-metals/how-rethinking-project-management-can-boost-mining-capital-productivity

6. ***Independent Management Services (IMS), Project Failure Statistics Among Capital Intensive Industries*** (IMS White Paper).
   This cross industry analysis reports that over 70% of large capital projects experience schedule delays, with mining and metals particularly exposed due to fragmented governance, contractor misalignment, and execution complexity.
   https://ims-web.com/blogs/project-leadership/project-failure-statistics-among-capital-intensive-industries/

Author

JJ Van Pletzen
Principal, Mining and Metals, US & Canada, dss+
JJ.VanPletzen@consultdss.com

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