Operator Readiness after Commissioning

Background

Modern manufacturing technology requires sensitive technical processes that are driven by highly automated production systems with automated sensors and digital information outputs. These environments require process specific knowledge in combination with the ability to perform data driven problem solving. This is in stark contrast to the conventional view of operator capability, which is focused on a sequence of actions rather than on a sound understanding of the production process.

A classic commissioning involves a “clean” handover from the engineering team to the production team after the engineers are assured that the plant is running according to the operational standards. Typically, a productivity loss worth 10% -15% of the capital investment value occurs after such a commissioning when operators ‘learn’ to run their plant. This period of adjustment is at least 18 months during which operators learn through trial and error, without any clear guidance.

Why does this happen?

Operators are trained to perform a sequence of actions. They do not necessarily understand the reason nor wider implications of their actions. This works fine in a traditional manual setting where there is a direct feedback loop with each action. The operator is able to ‘see’ what they do.

However, modern manufacturing technology involves technical processes that are driven by automated production systems that react to changing production parameters. Again, the system works when the operational environment is static and when equipment can continue to behave exactly the same as it did when it was programmed.

Unfortunately, a production system is a highly complex environment and it is near impossible to pre-programme all possible variations. A changing environment needs adjustments which requires operators to have process specific knowledge and act on information derived from data driven problem solving. This requires a very different skill set than carrying out a sequence of actions. The inability of operators to react to and correct imperceptible changes in the process allows the process to veer of course unchecked until it is fully derailed.

In contrast to common understanding, this problem is augmented not mitigated by automated data generation and digital information outputs, as these place another layer between the operator and the process and requires an understanding of trends analyses and additional abstract thinking.

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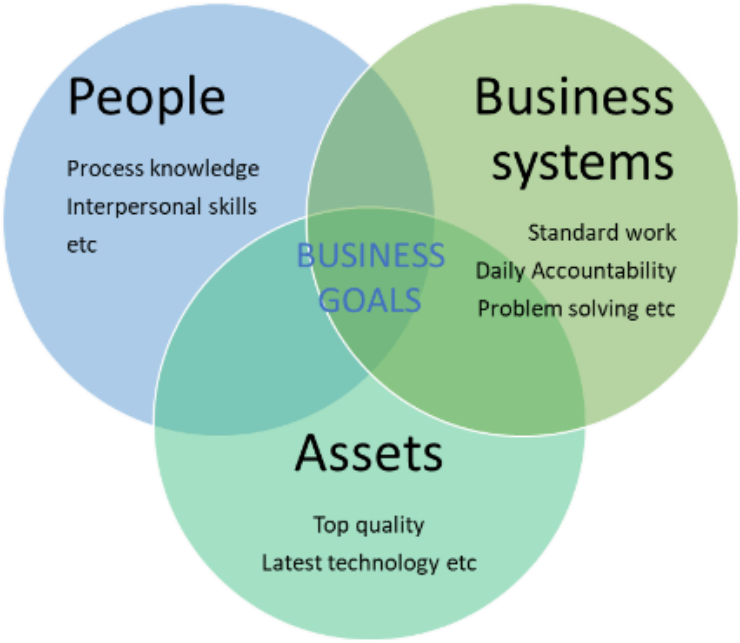
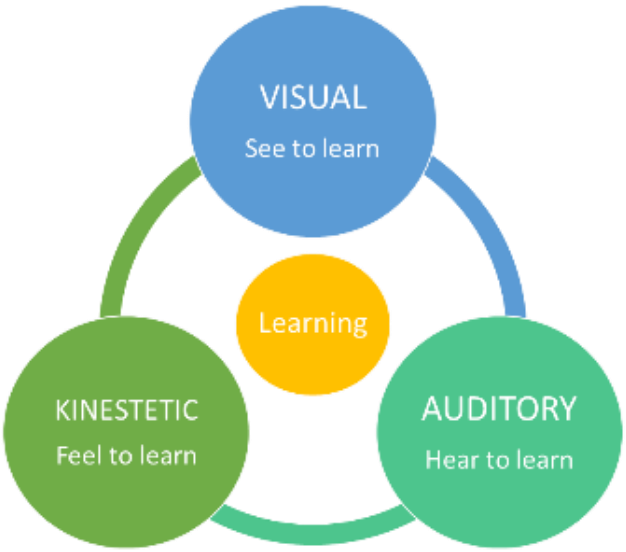
Productivity People

Our consultants and knowledge management experts have been part of significant and successful programs in building and developing operator capability and are able to develop a plant specific operator capability program that will remove this potential loss in productivity. The program prepares operators to work actively alongside commissioning engineers to ensure that assets are performing as per specifications. We specialise in developing and providing sustainable best-in-class improvements across the width and depth of any business or organisation. Every business is different, so we have a suite of methodologies and processes, which we utilise to deliver a bespoke, sustainable solution to improve your business performance.



Approach

The program recognises that good plant performance is the result of a skilful integration of three core business areas: People, Assets and Business Systems. To reach sustainable levels of high plant performance, all three of these areas need to be addressed. A learning scaffold takes operators through increasing levels of complexity practicing on the exact equipment they will be working with. It commences with basic plant layout reconnaissance and moves through to advanced skills using data analysis and structured problem-solving. In contrast to teaching a sequence of actions, the capability build creates and fosters a culture of learning and understanding by teaching to question why tasks are performed in certain ways.

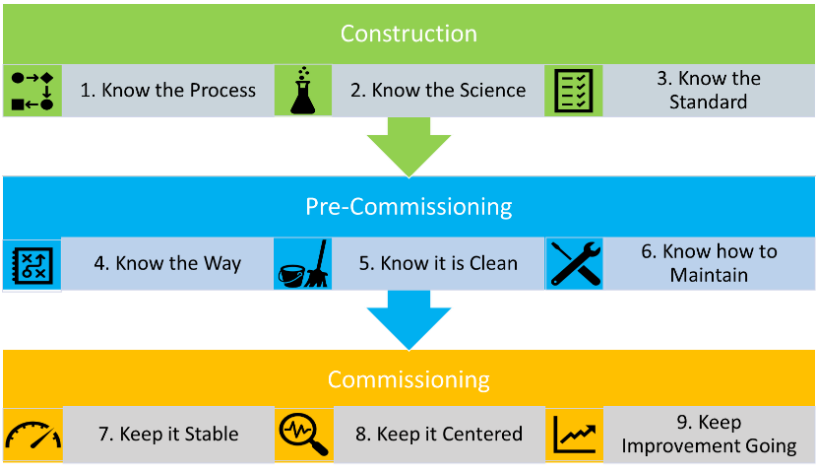


The learning framework is based on, and aligned with, the latest research on adult learning and knowledge management. The creation of innovative, hands-on learning activities ensures that operators are engaged with technical concepts in a practical manner. Activity design is based on a consideration of the various learning styles typically found in manufacturing: visual, auditory and kinesthetic. Operators will work with real examples from their own (future) plant.

The Programme

Each programme is customised to each specific process and facility but generally consists of 9 modules in 3 phases that align with plant construction phases:

1. off-site learning during construction and
2. on-site learning during pre-commissioning
3. On-site commissioning and problem solving.



The first phase focuses on fundamental science and technology education that is process specific, completed with statistical knowledge if required. It uses plant specific knowledge such as P&IDs and process maps.

During the second phase operators are actively involved equipment testing, which results in an intimate knowledge of their kit. This period is also used to introduce Standard Work including cleaning routines, visual management, 5S and the implementation of Daily Meeting Structures.

When both the plant and the operators are ready, the engineers together with the operators commission the plant into production at name plate capacity. They are then capable and ready to use continuous improvement and problem solving to further stabilize and improve productivity.

Benefits

In addition to the measurable financial benefit of the prevention of a 10% drop in productivity, the program has several additional, less tangible benefits:

1. Operation Team Leaders deliver training – Relationship building starts before the plant is in operation; team leaders get to know the capabilities of their people.
2. Development of self-awareness and interpersonal skills, as well as coaching and reflection, to assist in team formation before the plant is in production.
3. Operators are trained to the highest standard – Cooperative learning development with subject matter experts ensure the learning process is factually correct and aligned with current best practice and not dependent on the know-how of the facilitator.
4. Capability build program enables operators to be confident to rapidly take charge of their own area when production starts.
5. Create a culture of teamwork and equipment care where operators will strive to continue to improve results.
6. Consequent training of new team members to the same standards ensures sustainable business performance.

"The program has been beneficial. It would have been even better to have operators involved at an earlier stage"

Simon Dawson; Aurecon Services Manager

Mozzarella 3 commissioning Clandeboye Fonterra

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