FOUNDRY OPERATIONS – WHO LEADS IT…….???

"KNOWLEDGE OR EXPERIENCE"

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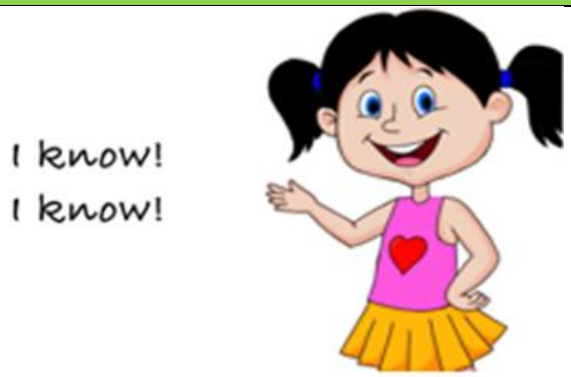
PREAMBLE:

I just came up with an idea of cheering Readers with a presumptive race between ***'KNOWLEDGE & EXPERIENCE'*** in Foundry Operations. We as a family of all the stakeholders in the Foundry activity are Knowledgeable and Experienced – some dominant in one or the other characteristics; some even having both characteristics. My deliberation here is to focus and try to analyse what is more important in Foundry Operations particularly in this era of Digitisation and Data prominence and now AI. I also thought that It is also important for the young ones joining the Foundry family who are busy looking for solutions through Google or App operated Programs only. They should go through the script more importantly – an advice coming from one who is probably 2 generations older than most - to excel in the Profession they are in now. Happy Reading & Casting.

WHAT DO WE MEAN WHEN WE SAY THAT: "WE KNOW?"



In normal conversation we use KNOWLEDGE to mean:

1. **"Knowing That"** (Facts and Information) like Knowing that the Earth circles the Sun.
2. **"Knowing How"** (The Ability to do Something) like Knowing how to drive a car.

So, what exactly do we mean when we say that 'We Know' or when a Scientist says that he knows what goes on inside an Atom or what happened in the first three minutes in the Life of a Universe or when an Economist says that he knows how an Economy functions?

What they really mean is that they have what they call a "Model" of the Atom or of the early Universe or the Economy or whatever, it is they are interested in, and that this model matches the results of their experiments or their observations in the real World. This, however, is not a physical representation of a real thing; the way a Model of an Aircraft represents the full-scale Aircraft: but is a mental thing which is described by a set of mathematical or logical reasoning and relationships.

So, when we say that we know something, we mean that we have a model of that something in our brain which is corroborated by our real-life experiences. It also contains our beliefs and expectations. "If I do this, I will probably get that." Crucially, the brain links all these things together into a giant network of Ideas, Memories, Predictions, Beliefs, etc. Any person claiming to have the Knowledge understands the Logics, Interrelation scripts and can reason out what makes it or what fails it.

To Know that we know what we know and that we do not know what we do not know, that is true knowledge. Confucius

WHAT DO WE MEAN WHEN WE SAY THAT: "WE HAVE THE EXPERIENCE?"

In normal conversation we use EXPERIENCE to mean:
1. **"Experience"** is a practical contact with and observation of facts and events leaving an impression.
2. **"Experience"** is also a process of getting a skill from doing, seeing, or feeling things.

So, when one says that he has the EXPERIENCE, it means that he had a direct practical contact with the event or observed the contact made by others and then has it got repeated himself or confirmed by others. It can be out of the skill or expertise acquired – even partial or blurred - or just carrying out an action out of his intuition or experiment. The repetition and the success obtained by that make an individual more confident and people hail him as an 'Expert' for a particular action.
But ***he may fail if a similar action*** – certainly not the same – is expected out of him. The main reason is that he does not know the logic and scientific facts in getting the result as expected. Same job with same tools and same environment, without any knowledge just make him a sort of 'Robot' and will create his own identity as Experienced for that activity only.
It must also be put on record that Experience is important. It gives someone a confidence to carry on same job day in and day out and willingness to prepare accordingly for what may be required as he proceeds along the track based on his experience.

Mistakes increase your experience and experience decreases your mistakes and others learn from your success. APJ Kalam

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WHAT DO WE MEAN WHEN WE SAY THAT: "WE KNOW AND ALSO HAVE THE EXPERIENCE"?

With Knowledge and Experience imbibed in one person, he stands on a **higher pedestal**. He is fully aware that because of the knowledge gained by him of 'What & Why it is to be done' and because of the experience gained by him, he also is aware of 'When & How it is to be done'. It can be easily surmised that Knowledge and Experience form the pillars of **Success.** Jointly they form the action plans for the operations and set goals for all that is needed to achieve the objective.
Just having experience does not make one an expert, but it gives him some standing in that direction and he does not have to wait to be told what is to be done. However, by providing him the related Knowledge and setting forth facts and ideas that are reliable and verifiable, and he becomes more competent to fill in the gaps in his own concepts and

understanding. Knowledge helps him to expand his Experience and gain influence by applying the knowledge carefully, not recklessly.

How does one become an expert? Well, ***knowledge – even part of it - is the prime necessity for it*** and supplemented by experience which also is surely part of that process. what is needed by the world. But we must be careful, who we should elevate to that rank. Multiple experts tend to compete with each other for primacy, contradicting each other, and lessening the value of expertise. A selfless working with focus on 'SHARE & CARE' is rule for the day, briefly put as that 'Experts should guide, not rule'

NOW OUR MAIN ISSUE: "FOUNDRY OPERATIONS WHO LEADS IT……???" KNOWLEDGE OR THE EXPERIENCE".

Foundry Technology, is a Technology of creating a new shape(casting) in ***an unseen, untouched and formed in a hostile inapproachable environment with no chance of course correction*** at its final stage. But all said and done, it's not a Rocket Science. In a crude language, it is like training an elephant to dance, and dance he can if properly guided. Once over, the elephant's movements are following the specified tunes.

It can be called as a science of some basics like for example - Metals and their Physical parameters but within a range, certainly not a pinpointed one, due to process and manufacturing variations. ***For this reason, the Knowledge gets firmed up by facts established during trials alone. There is no fixed Formulae, no fixed values to be deciphered/referred to and is based on a reductive explanation.***

Recent advancements in all Technologies - Foundry not being any exception - have created shortcuts to Knowledge. The whole information in this ***era of – 'Bottomless Pit of Information'*** – is possible by pressing a button only and this is an overall benefit to Humanity by way of advancements made in it. In Foundry operations – the area of our focus – efficient and light components have been designed, consistency of the product is improved, complexities have been resolved, productivity is enhanced, cost is reduced and so on. But technology is not there for our lack of restraint. Human nature is improved and enriched by experience more than expediency.

When the issue of harnessing the advanced Technology cropped up, Experience took it over and branded one who gathered it as **'EXPERT.'** Simple logic says that it is due to the back up of Knowledge of why and how it works and what can go wrong associated with the Experience of doing it right all the time within the set pattern.

Latest developments in Information Technology like Digitilisation, Data Analysis, Artificial Intelligence with field concurrence have helped a lot in Foundry operations. Solidification Simulation of a Casting Geometry is one such example. The tool/facility so developed for present generation has been very useful in designing a Method Sheet by any person trained for it but ***he cannot be marked as an EXPERT until he has carried out practical trials.*** One who has gone through the drill himself will understand the problems/issues involved and by engaging himself he is readying himself for the Podium of EXPERTS.

Let us consider, just for understanding, Foundry operation like Cake Baking. While Baking a Cake, the Chef gets all the ingredients, he needs. He also knows about operating the equipments needed for preparing the cake – Weighing Machine, Mixing Machines, Oven for baking, stop watch etc.; he has the recipe script with all operational features spelt out. But despite the knowledge, facilities, process script, he cannot produce a good cake. Reason – lack of experience. We look at it with another angle, Another Chef having the experience of making certain types of cakes but due to his limited or poor knowledge, he will make a mess of it when he is asked to produce a special variety. All this surmises to – one should have knowledge and experience both – let us name it ***A Sunshine Quality & Attitude***.

Foundry operations also being akin to cake making, the operating person – ***Foundryman – must have a fair degree of knowledge and the practical experience***; A clear message for new entrants as Foundrymen here: Google search engine will provide them all the knowledge needed to produce a Casting but he is unable to come out with consistent Quality Castings. The right 'Road Map' for them is ***'Hands on.'*** The tragic part of this Google knowledge, if I am allowed to put on record, is that the digital world is resulting in young people growing up with no physical assets of their own. Please note that this is without any Malice to anyone.

I beg to be excused for any irritation if caused by me to them. It must be noted that despite attaining a Masters in Foundry Engineering, I have personally learnt it the hard way – Melting heats after heats, Hand Moulding by ramming sand, Laboratory Testing - all by myself dirtying the hands with full of sweat and with such a background, I still cannot claim that

I have perfected the Technology, but definitely reached a stage where I know what's to be done and how it's to be done; What can go wrong and what are the necessary corrective actions to avoid them. The Text Books have supported me to an extent, but doing it myself, learning from shopfloor experienced operators (Pattern Makers, Moulders, and Melters and many more such people with no Technical Education) - making mistakes and then going to drawing board again – I came out with solutions, even 'Out of Box' many a times, making the operating system 'Fool Proof.

WHAT COMES FIRST – Knowledge or Experience in Foundry Operation?

Our Main Theme.

A question crops up – For Foundry operations to succeed both Knowledge and Experience being important, but then what is primarily more important. Most of us will say Knowledge followed by Experience. But it does not mean that an Experienced person may not be competent to gain the Knowledge later to be successful.

I do recollect a factual story published in 'Modern Casting' about 5 decades back in my early career where it mentioned about an Entrepreneur running an Aluminium Foundry facing a typical problem in one of his castings. He closed the Foundry, took admission in an Engineering College, completed the course and restarted the Foundry. In a week after restart, he could solve the problem once for all. In this case he did his course with the problem in focus – Knowledge followed by Experience.

So, both routes are possible. However, with Knowledge as first base makes the things faster and better because of the logical questions cropping up when the Experience is being attained faster as the Knowledge gives one a forewarning as to what is likely not to work and what are the probable remedial actions needed to avoid them. This way the foresight is sharper as well as quicker. With a greater and larger exposure, the objectives can be achieved in a short time.

Knowledge again practice and again knowledge. This form repeats itself in endless cycles and with each cycle, the contents of knowledge and practice imbibed with, takes one to higher levels. Mao Tse Dung

CONCLUDING:

Foundry Operation, as expressed earlier, is something where all the logic and scientific reasoning as available or understood lead to trials – not a sure shot always. The trials cannot be avoided at all at least as on date – almost impossible in achieving the objective in first attempt at all. I am sure most of the operating team must have witnessed that solution to an issue leads to another set of problems. However, one cannot jump to the trial directly. He has to apply whatever knowledge he has perceived, understood with an impetus of – if I do this, I would see it to happen or attain it. So, **THINKING** is the first Exercise, or the first step.

Thinking is followed by **DOING,** a sort of experimentation and establish the operating system for a product meeting the Technical requirement.

The next exercise is to **make the operating Parameters to be reliable and dependable**, so that the Product (Casting) meets the Technical requirements consistently. In a nutshell concluding remark will be - The Foundry stakeholders, thus must be a '***Thinker'****** first, ***'Doer'***# next and ***'Strategist'***@ at the end.

* Thinker for the Knowledge, #Doer for the Experience and @Strategist for the Success route.

FINALWORD: Apart from the narrative above I feel that in this race as described, there is another activity called – DILIGENCE: Having gained Knowledge and Experience, ***"IF NO DILIGENCE – NO SUCCESS"*** is the rule of the day. Foundry operations, despite appearing to be simple to do, are quite demanding on this rule. One must be on his toes sweating, and moving around the working area to see things following the activities, all around, strictly to the parameters set in. The abbreviations CTP (Critical to Process) and KPI (Key Process Indicators) are to be handled diligently.

The experienced and knowledgeable mountain climber is not intimated by a mountain – he is inspired by it. The persistent winner is not discouraged by a problem - he is challenged by it. William Ward.

"HAPPY METAL CASTING & MAKE IT A PASSION"

A THRILLING EXPERIENCE AWAITS YOU

With Best Wishes to all the Foundry Brethren.