

Volume 14, Issue 15 □ April 09, 2007

Important 2007 Dates to add to your calendar...

- **April 13th, 9-12pm, HPM IT Roundtable.** Host: Hammond Power Solutions, Guelph.
- **April 19th & 20th, Lean Accounting for Lean Manufacturing.** Led by Brian Maskell. Location: Pavillion Royale, Miss. Contact Barb at AME directly at 905-681-6039 or bjacklin@ame.org for details.
- **Apr 20th, GMT Meeting.** Host: Labelad, Markham
- **Apr 23rd, Lean Practitioners' Exchange.** Host: GE Multiin, Markham
- **May 7th, HPM SIG: Supervisors' Roundtable.** Host: Bird Packaging, Guelph
- **May 23rd, HPM Board Meeting.** Host: Volvo Motor Graders, Goderich
- **Jun 11th, HPM Lean Practitioners' Exchange.** Mancor Industries, Oakville
- **Jun 18th, HPM Leveraging Tour** Host: Nexans, Fergus
- **June 18th-22nd, LEAN CDN Regional "MeasureUp for Success Conference".** Location: Edmonton. Call-4-presentations: www.measureupforsuccess.com
- **Sep 5th, GMT Meeting.** Host: Willow Manufacturing, Toronto
- **Sep 10th, Leveraging Tour** [New Member - TBA]
- **Sep 19th, HPM Board Meeting.** Host: Tempress
- **Oct 10th, HPM GMT Meeting.** Host: Rockwell Automation, Cambridge
- **Oct 15th, HPM Lean Practitioners' Exchange.** Host: COMDEV Space, Cambridge
- **Nov 12th, HPM SIG: Health & Safety.** Host: Velcro Canada, Brampton
- **Nov 21st, HPM Board Meeting.** Host: GE Multiin
- **Dec 5th, HPM Share Showcase.** Location: TBA
- **Dec 10th, HPM SIG: Supervisors' Roundtable.** Host: Hammond Manufacturing, Guelph
- **Dec 17th, Lean IT Roundtable.** Host: Gerrie Electric.

TWI & Standard Work on the Rise

TWI(Training Within Industry) was developed during WWII to train replacements of an industrial workforce now fighting a war. It provided supervisors with critical skills that helped them rapidly and consistently train their teams. It also provided them with leaderships skills and the ability to analyze a job and recommend process improvements. TWI is recognized as part of what helped the U.S. win the war as we simply out-produced the enemy. This 60-year-old innovation is coming back & we're investigating bringing it here if there is sufficient interest. It is seen as a foundation of Toyota's success in CI and its ability to sustain improvements. **If you are interested – email Dave at dhogg@rogers.com**

TWI & Standardized Work... A conversation with the father of Standardized Work ~ Mr. Isao Kato
We are looking at providing TWI training which is 'rampant in Toyota' and was extracted from the Second World War. Interest is rising in it.

The following was noted in the Lean Consortium Newsletter. You can find this interview – and others – by visiting the "Art of Lean" website at www.artoflean.com. It is worth a peek.

Training Within Industry or "TWI" for short, continues to be used and refined today by leading companies like Toyota. The following is an interview with Mr. Ike Kato who spent 35 years with Toyota Motor Corporation in a variety of management positions in manufacturing, HR, training and development, and supplier development. Early in his career he was responsible for guiding external consultant **Shigeo Shingo** around Toyota facilities. Ike also worked extensively developing training material for TPS under the direction of Taiichi Ohno and other executives. **Internally at Toyota Mr. Kato is known as the "father of standardized work and kaizen courses"**. If you have ever taken a training class on either of these two topics, odds are you were trained by someone who was trained by Mr. Kato or one of his disciples. He is also a master instructor of TWI material. **"You cannot separate people development from production system development if you want to succeed in the long run"** comments Mr. Kato.

These notes were recorded by Art Smalley when he interviewed Mr. Isao (Ike) Kato on the topic of **TWI's Influence on TPS & Kaizen** last February.

Art: Thank you for agreeing to spend some time together and answer some questions about TWI and its influence on Toyota.

Mr. Kato: My pleasure. Nice to speak with you again.

Question: How was TWI introduced to Toyota?

Mr. Kato: TWI was introduced to Japan after WWII around 1947-48 I believe. It was implemented in other companies outside of Toyota first. In 1950, during the near bankruptcy period, management and the union made a series of agreements. One agreement was for Toyota's management to respond to the union's request to create some form of supervisor development and training. The HR department of

Toyota investigated existing programs and was introduced to TWI. Since it was an existing program and was receiving favorable reviews, it was evaluated and then adopted by Toyota.

Question: Which programs were introduced and in what order?

Mr. Kato: First **Job Instruction (JI)** was introduced in the December of 1951, then in succession **Job Methods (JM)** in June of 1952, and finally **Job Relations (JR)** in March of 1953. In each case about 300 people were trained in the methods and then more of course every year after that. JR was well received and remains almost intact to this day as a training course. We eventually altered the case study examples in the material. JM was less of a success and was abandoned after several years for reasons I will explain later on. JI was a big success and had the most impact of the three training courses by far. JI remains in Toyota today in a virtually unchanged fashion from the original.

Question: How aware was Mr. Taiichi Ohno of the programs?

Mr. Kato: Mr. Ohno himself was very aware of the TWI programs, and he was actually a trainer of the material. In particular he valued JI, but was frustrated with the JM as it did not fit well with his notion of improvement. I believe he was somewhat ambivalent towards JR.

Question: Why was JM abandoned after a couple of years?

Mr. Kato: As far back as 1945 Ohno was manager of a machine and assembly shop in Toyota and started experiments to improve flow and create a more efficient line and style of production. This became known as the "Ohno line". By the early 1950's his thoughts on Just in Time, kaizen, flow, multi-process handling, visual control, and standardizing work, etc. were pretty well established in the machine shops under his control, and being coached to his disciples. Initially Ohno was a proponent of JM even though he thought it narrow and lacking the scope to drive the type of kaizen that he wanted.

JM's main contribution to improvement is the 5W 1H (5 Whys and a How) method of inquiry which he viewed initially as all right but eventually decided was too superficial. He was driving the broader thinking of the various forms of waste and the specific need to eliminate the root causes of waste and improve efficiency in the company. JM emphasized the

Tried this Assessment Yet?

When/If you have a moment over the coming holiday, visit www.measureupforsuccess.com and click on the invitation to take the **Lean Self-Assessment**. Take it seriously and it can show you how your company is faring against some 80 firms from across Canada who have been into lean <1 year; <2 years; <3 years or >3 years. By reading carefully the descriptors for each of the 14 measure, you will have a good sense of what is yet to do... Take a beer.

principle of **ECRS** (Eliminate, Combine, Rearrange, and Simplify) and mainly looked at assembly jobs, machines, and the material handling aspects of work but it just did not drive deep enough into the elimination of waste aspect strong enough to suit Mr. Ohno.

Additionally, it must be noted that JM lacks any connection to takt time, flow, and pull style production. Eventually Ohno decided JM was not delivering results and instructed the training department to stop the JM component of the program.

Question: What was developed to replace JM?

Mr. Kato: In place of JM, Professor Shigeo Shingo was invited to Toyota by Mr. Ohno to teach his view points on industrial engineering and productivity. Eventually his lectures and teachings were summarized by me and a few others in the training department into what was called the "P-course". The P stood for production or productivity. This course was the main training vehicle for the next several years for all supervisors and engineers regarding methods-based improvements.

Question: When did the Standardized Work and Kaizen course appear?

Mr. Kato: Standardized work developed and was used as early as the 1950's in Mr. Ohno machine shops. Since it was fairly complicated involving three different forms and required time studies etc. not many people could do it correctly outside of Mr. Ohno's staff. Eventually, though, it became part of the supervisor training curriculum for TPS. Slight modifications were made every year for different reasons. An overall TPS reference manual was created in 1973 (former President Mr. Cho helped draft this) and in 1978 a true standardized work class was created by myself and others. Eventually a Kaizen training course was created as well and it is based on the following; 1) Ohno's thinking on

improvements and standardized work, 2) Shingo's "P-Course", 3) Some analysis elements of JM which survived intact (e.g. 5W 1H), and 4) also some of my department's own input.

Question: What are the main training courses for a supervisor today?

Mr. Kato: The stereotypical elements of **supervisor training in Toyota today are still JI, JR, JS** (Job Safety which Toyota developed) Standardized Work, Kaizen (sometimes these are combined as SW and Kaizen), Problem Solving, and the Role of a Supervisor. There are a couple others but these were the main ones we utilized.

Question: Which of the TWI courses had the biggest impact and why?

Mr. Kato: **JI was by far the most valuable and unique among the three programs as it brought a great method for 1) breakdown of the job, 2) creating a four step method for training others, and 3) developing a multi-functional skills planning matrix.** The reason this is critical is because Mr. Ohno was already experimenting with multi-process handling (which requires some standards for the job, a notion of takt time, and thus requires a way to teach others as takt time changes). Mr. Ohno embraced JI as a way to teach supervisors how to break down their jobs, create a job breakdown sheet, and train others. Of course, **the standardized work chart is needed on top of this job breakdown** to balance the line to takt time and analyze it for improvement. However Mr. Ohno would scold people if they had not broken down the job properly and written it down on paper for either the sake of JI or standardized work.

In a historical sense JI came at a critical juncture for Toyota as Mr. Ohno was now in a position between 1950 and 1955 to begin to roll out the learning points from the "Ohno line" to other areas in the company. The JI thinking is really critical and somewhat underappreciated in TPS formulation. **The capability to break down a job is fundamental in terms of helping create a standard for teaching and training others.** It is a much easier and smaller step than to create the three elements of Standardized Work (takt time, work sequence, and standard amounts of work-in-process) after JI is in place. Plus when you change takt time and move work around JI is the perfect vehicle to train people. For this reason I believe, and I think that Mr. Ohno would agree, that **JI had by far the biggest impact on TPS formulation.**

Question: What is more important JI or

Standardized Work?

Mr. Kato: It is not really a question of importance; **it is a question of sequence.** I don't think you can do a good job of implementing standardized work or several other elements of TPS without the JI skill set in place. I have observed quite a few companies struggle with implementing standardized work, kaizen, and other items. Often the short term gains companies obtain fall away over time. One direct reason why is that no proper plan was ever put in place to train people to the new method and the JI technique provides the exact skill set required to do this work. I can't see how standardized work can function without JI in place underneath to support it in the long run.

If you do JI properly you can eliminate so many problems that plague operations. You can stabilize the operation, improve productivity, enhance quality, and establish the fundamental elements of the job on paper for analysis. Then it is a much smaller step to next balance the line to takt time and to add the other elements of standardized work. This was the order at least in Toyota that we taught and had success with.

Question: Some have called TWI the roots of Lean – do you agree?

Mr. Kato: TWI had significant influence on the development of our thinking and way we structured supervisor training. It is underappreciated from that point of view. However, it is not the overall roots of Lean or TPS. TWI simply did not contain most of what makes up the unique and important aspects of TPS; seven wastes, takt time, flow production, pull system, Kanban, leveling, Jidoka, 5S, etc. It did give us a vehicle to enhance supervisor skill sets and it influenced the development of the Kaizen training course, however, that is certain.

Final Question: Why in your opinion is TWI critical?

Mr. Kato: It helps build capability into the organization at the supervisor level which is very critical for TPS to succeed. TPS won't flourish if just the staff and engineers are driving it from the side. The first line of supervision is critical in making small daily improvements, leading the work teams, and making the whole system stick together. In Toyota we had a saying, "mono zukuri wa hito zukuri" which means **"making things is about making people"**. If people want to succeed with lean or TPS they have to emphasize people development and making leaders capable of delivering improvements. TWI is a great starting point even today and a hidden strength of Toyota's production system.