

## INTRODUCTION:

### **Company Background:**

Lake Region is the world's leading OEM manufacturer of guidewires. These medical devices are used in keyhole surgeries to navigate through veins and arteries and to deliver interventional devices. Lake Region New Ross (LRNR) sells to a predominately US market, so the challenge is to remain a cost effective site for guidewire manufacturing.

To date this has been achieved via an intensive internal focus on cost containment through the deployment of lean techniques such as kaizen, cells, production levelling and TPM. With much of the obvious low hanging fruit consumed, achieving further cost reductions means delving deeper to solve complex process related issues, to build in stability and achieve higher first time quality.

Integral to the success of structured problem solving is the introduction of standard work. In achieving this, the role of training is pivotal, ensuring that standard work (i.e. countermeasures) can be effectively captured, implemented, verified, monitored and sustained.

“The need to train employees on job procedures (whether to accommodate changing work demands, changes and improvements in procedures or standards, workforce turnover, the increasing need for cross-functional training, the continual progress of technology, or the pervasive use of short term workers) is a regular and vital task in every working environment.” (Graupp and Wrona 2006 p20)

Yet in the majority of organisations, the training function is generally undervalued, under developed and under resourced. In industry in general the poor level of instruction experienced has lowered peoples and organisations expectations of training. The result is poor training effectiveness, feeding variation in production methods while detrimentally impacting process stability and product quality. This case study investigates the positive impact of taking a more scientific approach to training, namely Training Within Industry's - Job Instruction.

**WHAT IS TWI -JI:**

**Background to TWI:**

In the early days of WW2 many of America’s experienced factory workers were drafted into the armed forces. This created a serious shortage in skilled labour, at a time when previously unheard of levels of production were required in the war effort. In response, the US War Manpower Commission created the incredibly successful Training Within Industry programs to train supervisory staff skills in job instructing, job method improvement and maintaining good job relations. Each program was built around the scientific method see *Table 1*.

Step	TWI		
	Job Instruction	Job Methods	Job Relations
1	Prepare	Breakdown	Get the Facts
2	Present	Question	Weigh and Decide
3	Try out	Develop	Take Action
4	Follow Up	Apply	Check Results

*Table 1:* The four step structure of the Training Within Industry programs.

As stated in the TWI Report (1945 p16) the aim was to “Develop a standard method, then train the people who will train the other people who will train repeated groups of people to use the method.”

**The Job Instruction Method:**

Two common training techniques are telling someone or showing someone how to do a job. Independently these techniques suffer from flaws that lead to poor transfer of knowledge. As explained by Dinero (2005 p163-p164) just telling someone can be difficult as many operations are not easy to describe and just showing someone can be misleading because copying is not necessarily understanding.

Ji incorporates both telling and showing but in a predetermined and precisely defined manner to minimise the weaknesses inherent in both these methods and to maximise the trainee’s retention and learning. The technique breaks into two phases; **getting ready to instruct** and the actual process of **job instruction**.

How to Get Ready to Instruct:

A Job Breakdown Sheet (JBS) is a training aid that encapsulates the critical knowledge of a job required i.e. standard work. A JBS acts as a checklist against which the trainer can ensure the consistent delivery of the training material. The knowledge encapsulated in a JBS is generally what separates experienced from inexperienced operators and by focusing on the delivery of this knowledge through Ji drastically reduces the learning curve. The codification of organisational knowledge into standard work is vital or else each project has to begin by establishing what is really happening on the shopfloor.

JOB BREAKDOWN SHEET		
AREA: Assembly	JOB: Distal Welding	DATE: 03/12/2007
		WRITTEN BY: D. Kelly , J. Cullen, J. O'Dwyer
IMPORTANT STEPS (WHAT)	KEYPOINTS (HOW)	REASONS FOR KEYPOINTS (WHY)
	SAFETY: Injury avoidance, ergonomics, danger points QUALITY: Defect avoidance, check points, standards TECHNIQUE: Efficient movement, special method COST: Proper use of materials	
Step # 1 Clean welder collet	1. Clean collet face every 25 parts. 2. The collet must be closed during cleaning . 3. Use Emry paper to clean the collet. 4. Every 100 parts use air to blow out collet in the open position. 5. Ensure that the collet stays in the barrel it came in.	1. Any more than 25 will let collet get dirty causing more defects. 2. The collet must be closed so dirt wont get in between the jaws of collet. 3. Emry paper wont scratch the collet face. 4. This prevents dirt building up between the jaws of the collet loosening it. 5. They are a pair swopping them will cause the collet to loosen or tighten.
Step # 2 Welding parts	1. Hold the coil between thumb and two fingers. 2. Slide coil through bushing unill touching the shield. 3. Hold until the welder arc fires. 4. If rework is higher than 2 per bundle stop welding 5. Check for tails or inconsistent core protrusion.	1. Stop coil and core moving during welding creating loose cores. 2. Contact with shield is correct distance to prevent small weld or loose core. 3. Stops the coil slipping back to incorrect distance. 4. You must stop if rework is high in order to fix the problem . 5. To get and give feedback to the trimming operators.

Figure 1: A typical Job Breakdown sheet as used by Lake Region.

Before job instruction is carried out, a JBS must be prepared (refer to Figure 1). In a JBS work knowledge is first broken down into major steps, i.e. **what** to do, then further broken down into keypoints. A major step is any task that advances the progression of the job, while keypoints are the experts tips / guidelines on **how** to perform the major step satisfactorily each and every time.

Keypoints are highlighted by asking the following questions while working through the finer details of a job. (Liker and Meier 2007 p164):

- Does the detail effect quality?
- Does the detail effect productivity?
- Does the detail effect safety?
- Does the detail effect cost?

The JBS also includes reasons for each of the 'Key Points'. These reasons explain **why** a task should be done a specific way and the consequences to the operator, organisation or the customer if the standard method is ignored.

The instructor must ensure the workspace, tools, equipment and documentation and are in proper order in advance of the training session. This will encourage very early on a positive attitude to preparation, organisation and housekeeping in the mind of the trainee.

#### How to Instruct:

In the Job Instruction method there are four steps:

##### **STEP 1:**

Firstly, great care is taken to **prepare the worker**, establishing their experience level and then putting the job in context, prior to teaching them the job in small manageable chunks.

##### **STEP 2:**

Then trainer **presents** the job in a tightly scripted manner at least three times. The training content and complexity is built up slowly in layers in order to ensure learning has occurred and has been retained.

##### 1<sup>st</sup> Demonstration:

Trainer demonstrates the job telling the trainee what the major steps are.

**Sample dialog:** (e.g. The first major step is ...)

2<sup>nd</sup> Demonstration:

Trainer demonstrates the job telling the trainee what the major steps are and explains precisely how they are to be executed.

**Sample dialog:** (e.g. The first major step is ... it has three keypoints ... the first keypoint is.)

3<sup>rd</sup> Demonstration:

Trainer demonstrates the job telling the trainee what the major steps are how they are to be done and explains why this is the best way.

**Sample dialog:** (e.g. The first major step is ... it has three keypoints ... the first keypoint is... the reason for the keypoint is...)

The idea behind explaining why is to develop a greater depth of understanding of the job. It emphasizes the impact of the key points on important factors like safety, quality, cost and ease of the job. This encourages a more conscientious attitude towards standard work and also sets up a valuable knowledge resource which can be pulled into problem solving or improvement activities.

**STEP 3:**

The trainee is asked if they wish to **try out** their performance or if they want more trainer run throughs. If the trainee says yes they are asked to demonstrate four times.

1<sup>st</sup> Demonstration:

Trainee demonstrates the job without having to explain.

2<sup>nd</sup> Demonstration:

Trainee demonstrates the job telling the trainer what the major steps are.

3<sup>rd</sup> Demonstration:

Trainee demonstrates the job telling the trainer what the major steps are and explains precisely how they are to be executed.

#### 4<sup>th</sup> Demonstration:

Trainee demonstrates the job telling the trainer what the major steps, how they are to be done and explains why this is the best way.

Any errors made during the trainee demonstration are to be immediately corrected by the trainers. The responsibility for successful completion of training rests squarely on the instructor's shoulders as captured in the JI mantra below.

"If the learner has not learned then the instructor has not taught" (JI Manual 1944 p16)

#### **STEP 4:**

The trainer puts the trainee to work and introduces them to a co-worker that will act as a conduit for any additional questions. The trainer will **follow up** regularly tailing this off once it has been verified that the training has been successful. At this point it is important to stress that standard work is still regularly audited by supervision.

#### **JI TODAY AT TOYOTA:**

An integral part of TPS today is the tightly defined role and responsibilities of team leaders. Their responsibilities are virtually identical to the skills promoted by the TWI program. A team leaders responsibilities at Toyota are to (Kreafle 2008):

- Write Job instructions for standard work.
- Train Operators on standard work.
- Make Improvements to standard work.
- Audit / Respond to problems with standard work.

Art Smalley interviewed Isao Kato, the father of standardized work and kaizen courses at Toyota, as he stated "you can do no good of implementing standard work or several other elements of TPS without the JI skill set in place." (Dinero 2007 p7). Indeed many now believe that Ohno's initial efforts at Toyota were floundering until TWI was introduced and provided a potent mechanism for standardization, codification and delivery of his ideas. (Bicheno and Holweg 2008)

At Toyota, as discussed by Liker and Meier (2007 p145), "it is clear to everyone what the critical aspects of the work are, and the importance of doing them in a specified way."

At Toyota supervisors are trained to ask probing questions:

- How do you do this work?
- How do you know you are doing this work correctly?
- How do you know that the outcome is free of defects?
- What do you do if you have a problem?

As Spear and Bowen (1999 p99) discussed continually, asking these questions generates deeper knowledge of the work, develops problem solving skills and aids the improved design of activities. Ken Kreafler, former production engineering manager at Toyota's Kentucky plant, adopted this exact approach on his recent site visit to LRNR.

There are several factors influencing the formation and ongoing effectiveness of this role for supervisors. They are the need for:

- Tightly defined areas of responsibility (i.e. focused process knowledge).
- Very low ratio of operators to first tier 'supervisors' (i.e. 4 to 1).
- Production controls built in into the work (i.e. kanban).

The recent spat of damaging product recalls at Toyota have in part at least been tracked back to a loss of discipline in adhering to standard work (Shirouzo and Moffet 2004 p1-3). When Toyota investigated the root cause it was found that rapid growth drove the premature promotion of supervisors. These recruits have foregone the vaunted on the job training and subsequently regressed to the traditional office based roles, no longer regularly walking the floor or auditing standard work.

**ESTABLISH THE TRAINING NEED:**

To analyse the workforce's perceptions of training at LRNR, a questionnaire was distributed to a cross section of forty employees. This helped to highlight potential for improvement in the existing training infrastructure.

**Main Perception of Training:**

Each participant was asked to select the problems that affect their plant from an original TWI list. The topics of understanding and interpretation were high on the list, suggesting shortcomings in the level or management of process knowledge and/or the capability to train. There was general consensus that much valuable knowledge is lost when experienced people leave the company.

**Infrastructure of Training:**

In the results of the questionnaire the formal / informal delivery mechanisms utilized for training within Lake Region were teased out.

**Who delivers training?:**

The majority of training in LRNR was carried out by experienced operators and team leads from within the production departments.

**What training material was referenced?:**

When the operators were asked how they were trained, all recalled learning from observing experienced production personnel but only half mentioned the SOPs as a training reference.

**How was the time spent?:**

The majority of the allocated time was spent physically doing training, with preparation and follow up remaining under emphasized.

What was emphasized?:

There was near deadlock on whether the emphasis during training is on first achieving either quality or hitting quantity. One comment was that “the focus is on teaching the bare minimum to get the person up and running.”

How was training effectiveness verified?:

Training effectiveness was only measured in jobs charged with detecting quality fallout and for all other jobs it only becomes an issue when exceptions with rate, scrap or rework arise.

Impact on Standard Work:

When asked what impacts the sustainability of standard work, the responses were operator involvement in generating the method, clear definition of method and if it makes the job easier. It is notable but not surprising that the capability to train does not appear in the top three. Its impact is often underestimated.

What Job Relations Issues occur? :

‘Friction between shifts’ was the highest recurring job relations issue in the questionnaire results. In the opinion of the author, each shifts preference for different and often antagonistic methods of work is often a significant player in this.

**Outcome of questionnaire:**

The potential for improvement in the training system had been established. The author set about securing the necessary backing required to launch the required program of reform via the deployment of Job Instruction.

**DEPLOYMENT PLAN:**

The basic outlines of the steps used to deploy JI in the pilot area are summarized below.

- 1.0 Secure managerial backing for deployment.
- 2.0 TWI Trainer trained by TWI Master Trainer.
- 3.0 Determine Pilot Area.
- 4.0 TWI Trainer trains a Workplace Trainer(s).
- 5.0 Select a job for training.

- 6.0 Determine the best method.
- 7.0 Create a Job Breakdown Sheet.
- 8.0 'Learn by Doing' - Practicing JI:
- 9.0 Follow up and assess effectiveness.

### 1.0 Secure managerial backing for deployment:

The findings of the questionnaire were presented to the board of directors, they accepted them and validated many of the findings against their own experiences. Just prior to this, the first JBS had been created to support the introduction of standard work at LRNR. These rudimentary JBS were compiled by referencing the original TWI materials. In the JBS the board of directors saw the potential for addressing the gaps in training.

### **Supporting Infrastructure:**

Following Dinero (2005 p91) the roles and responsibilities of the people required to implement a TWI pilot are depicted in *Table 2*. The people chosen at LRNR's as the pilot progressed are listed opposite their respective roles.

<b>Jl Pilot Group</b>		
<b>Role</b>	<b>Responsibility</b>	<b>Who</b>
Training Director	To meet the organisations training needs.	HR / Training Director Production Manager
Master Trainer	To train the TWI Trainer in JI method.	TWI Consultant
TWI Trainer	To teach the Workplace Trainers how to use the JI method.	Initially a C.I. Engineer handing over to Training Specialist.
Workplace Trainers	To uses JI to teach trainees on production jobs.	Three full time trainers.
Trainees	People at the workplace that the trainer is training.	Production operatives

*Table 2: Infrastructure of the JI Pilot.*

### 2.0 TWI Trainer trained by TWI Master Trainer:

With the above backing secured the company financed the training of its first TWI Trainer. This trainer was taught the basics of JI on the traditional 10 hour course taught by TWI Master Trainer Donald Dinero. It should be noted that a 40 hour 'Train the Trainer' course is required to become a fully certified TWI Trainer.

### 3.0 Determine a pilot area:

The pilot area chosen was the project area where the first introduction of standard work had occurred. This was supported by the fact that this area had:

- Highlighted the most issues in the questionnaire.
- The greatest variety of products and processes.
- The lowest amounts of improvement focus to date.

### 4.0 TWI Trainer trains the Workplace Trainer(s):

At LRNR the decision was made to put dedicated trainers in place to support the introduction of JI. The author is fully aware that the separation of training and supervisory roles is a big departure from TWI canon.

The first tier supervisor's role was already in the process of being restructured to focus on the auditing of standard work. Adding further responsibilities at this time would be untenable. This is a real shame as the first task these supervisors undertook was to re-familiarise themselves with the procedures. If they were also the designated trainers they would already know them implicitly.

Instead the newly appointed trainers are focused on training and in a better position to concentrate on the successful introduction of the job instruction method. It would be the researcher's long term intention that these two groups would cross train each other and develop toward the TWI ideal.

### 5.0 Select a job for training:

The job selected for training was one of the operations covered by the initial standard work projects. The aim is to target training efforts towards the 'area' of greatest need by:

- Using Pareto charts to target the recurring quality issues in order of impact.
- Root cause analysis as part of deployment of structured problem solving.
- Selecting the processes that have been historically the hardest to train on.

### 6.0 Determine the best method:

For many processes the best way may be relatively easy to ascertain. But in the standard work project the plant's production manager had spent weeks building up quantitative evidence and getting the root cause of which factors explained the varying performance of different operators. The key points of each element of the operation came to the fore when designing countermeasures (i.e. standard work) to reduce or eliminate these factors. These countermeasures reduced rework by 80%.

The production manager experienced firsthand the difficulty of implementing / sustaining standard work, the need to explain 'why' and understood the necessity to improve training mechanisms. The production manager showed her conviction when she was offered two additional supervisors and instead choose to hire two trainers with the focus of addressing the ongoing issue of training.

### 7.0 Create a JBS:

The TWI Trainer and Production Manager observed the work being done by an experienced operator. The key points were mapped out in sequence and recorded. Each of the countermeasures from the standard work project had a corresponding key point. As the reasons for each of the key points were defined this codified the essential learning's of the standard work project. This process yielded the backbone of the new JBS.

### 8.0 'Learn by Doing' - Practicing JI:

When the JBS was used for the first time it became apparent that, though it was a quantum leap over a SOPs, it was still underdeveloped and in need of revision.

#### Issues encountered with early JBS:

- Content must be in manageable chunks i.e. not too many key points in one major step.
- Key points missing from the JBS became apparent during demonstrations.
- The improper use of the word 'and' to combine two separate key points caused confusion.
- Some key points written too long, too hard to remember, these must be written shorthand.

- Same language must be used consistently to aid the trainee's ability to memorize e.g. not cut and trim interchangeably.
- If the JBS is in view of trainee during training, it distracts them from the demonstration.
- Pictures on the JBS create a temptation to fore go the live demonstrations altogether.

During the practice runs with the JI technique the following observations were made of factors which were impacting the effectiveness of the different JI practitioners.

Issues encountered with Job Instruction:

- Failure to enumerate steps or points, destroys the trainees framework for sequencing compartmentalizing and memorizing content.
- Trainers must know task being taught and not be struggling with both job and JI methodology.
- Operator should be given the same vantage of the work as the trainer demonstrating.
- The importance of body language and use of visual cues to maximise training effectiveness.
- 1 to 1 instruction is vital to tailor the session to each individuals needs e.g. left or right handed.
- Tendency to under emphasize the 'prepare the worker' and 'follow up' steps.
- The trainer must stop the demonstration if the trainee wishes to take notes or ask questions.
- Trainees used to verbal barrages can be anxious during the first JI demonstration which is almost silent.

9.0 Follow up and assess effectiveness:

Initially trainees were revisited after a week to assess their comprehension and retention of the material. In the longer term, the intention was that the effectiveness of training would be assessed through regular auditing of standard work. These checks will be carried out daily by team leaders (i.e. first tier supervisor) with secondary checks being carried out weekly by the area supervisor and training specialist.

**THE PILOT - JOB INSTRUCTION vs. TRADITIONAL TRAINING:**

With the basic skills in place LRNR had the opportunity to compare the effectiveness of the two training methods prior to committing any additional resources. This comparison was carried out by training two operators, one via traditional means and one via Job Instruction. The findings from the experiment and observation of the practice sessions are summarized in the *Table 3* below.

	<b>Traditional Training</b>	<b>Job Instruction</b>
<b>Preparation</b>		
<b>Operator Introduction</b>	Sent to get chair, to sit at PC. Trainer begins to read.	Shown line and work station. Job put in context. (to int./ext. customer) Establish relevant skills / experience level.
<b>Trainer preparation</b>	Little or no time allotted	Summarize critical points into JBS
<b>Structure</b>		
<b>Location</b>	First theory at PC. Then practice at work station.	Theory and practice together at work station.
<b>References</b>	<u>Standard Operating Procedure</u> Written by Engineer Long / Generic / Patchy/ Unclear Important points easily missed or absent What, How Soft copy away from work station Designed for ISO compliance	<u>Job Breakdown Sheet</u> Written by Trainer Concise / Specific / Sequential/ Clear Broken down into keypoints What, How, Why Hard copy at work station. Designed for training
<b>Language</b>	Unbroken barrage of dialog. Unpunctuated/unscripted/ inconsistent All details muddled together	Basic English using few words. Enumerated / Scripted / Consistent Build up of detail in layers
<b>Approach</b>	Do	Plan-Do-Check-Act
<b>Initial Time</b>	45 mins	40 mins
<b>Trainers</b>	Part time - Line lead Not necessarily suitable trainers Doing day job while training Don't have time for proper training	Full time - Trainer Tested aptitude for training Focused on training Time dedicated
<b>Targeted Objective</b>	To get operator up and running	Perfect Quality /Safety on first run Productivity and cost after practice
<b>Outcomes</b>		
<b>Operator sentiment</b>	Company does not care about training Afraid / Pressurized / Apprehensive Not comfortable asking questions	Company cares about my training Well taught / Confident / Conscientious
<b>Trainer sentiment</b>	Under pressure for day job Frustrated with interruptions Trainee misinterprets source of agitation	Company cares about quality of training Believe in power of method
<b>Operator interest</b>	Start interested, bored after SOP	More interested as they know 'why'
<b>Quality emphasis</b>	Specs unclear / Poorly explained Safety prioritized more. Output prioritized more.	Specs clearly taught and understood. Pictures of defects used. Consequences of quality understood
<b>Quality Performance</b>	2 rework out of 100.	0 rework out of 100.
<b>Operator Comment</b>	Training hard to grasp / forced to learn by experience /watching others.	Easy to pick up / Quicker / Language used helps inductees or non nationals
<b>Level of knowledge</b>	Low, enough to get it done.	High, able to converse on specifics.
<b>Standard Work</b>	Several key points missed	Strong adherence to all key points
<b>Problem Solving</b>	Told to store defects and rework until end of shift	Understands main issues, when to call supervisor / technician.
<b>Follow Up</b>		
<b>Follow up checks</b>	No timetable, told to ask for help Trainee must highlight own shortcomings	Clear timetable for checks, carer assigned. Ongoing assessment of trainee & trainer.
<b>Knowledge retention</b>	After one week with no interim practice Initial gaps have reappeared. Led to 33% rework	After one week with no interim practice One slip on one part, self corrected.

Table 3: Summary of the findings of the experiment.

**WHAT ARE THE KEY BENEFITS OF JI:**

The job instruction approach is as much of a leap over traditional training as structured problem solving is over fire fighting behaviour. It is scientific analysis of what constitutes standard work and the factors that impact the organisational capability to deliver this. The marked difference in operator sentiment, operator comprehension, knowledge transfer and retention, training time, quality of work, problem solving capability and adherence to standard work all point toward this conclusion.

Ji develops a systematic way of thinking about work that supports learning, problem solving and encourages work method improvement. It develops a culture of respect for the individual, adapting delivery to their needs, educating them 'why' specific work methods are used and promoting a confident and conscientious attitude.

It is a foundational infrastructural component required by any company pursuing continuous improvement. It allows countermeasures to be deployed through standard work and therein creates a baseline or degree of stability from which further abnormalities are exposed.

The job breakdown sheet is word for word a superior format as a reference during training than a standard operating procedure. It is a concise yet precise checklist of critical process knowledge. Its layered approach to building up detail is solely designed to facilitate training.













Since the introduction of the eight step problem solving process JBSs have been uniformly adopted as the means to document or deliver refinements to work methods implemented as countermeasures. The researcher witnessed a multidiscipline team consulting the JBS when confronted with a process issue to ensure the key points of standard work were being adhered to, before looking any further.

**THE CHALLENGES OF IMPLEMENTATION:**

After the initial very positive outcomes in the pilot project the effort to implement JI more widely has been subject to number of challenges or issues as discussed below.

The handover of the pivotal leadership role of TWI Trainer from the initial researcher to the training specialist occurred far too quickly, well before the new recipient had the opportunity to develop the requisite knowledge or skill. This had lasting consequences as manifested in the other issues discussed below.

Initially at least the organisation had mistakenly equated success in implementing JI with rapid proliferation of JBS. This is likely because the JBS is the most immediately tangible element of the JI technique. It needs to be understood that they are not standalone solutions, though significant, they constitute only the preparatory step in the proper application of the job instruction technique (Refer to Table 4).

Job Breakdown Sheet	Job Instruction	Training Outcome
		
		
		
		

*Table 4: The combined impact of JI and JBS.*

The prioritization of JBS’ led to the postponement of the actual practice of Job Instruction breaking a vital linkage or feedback loop. Many of the JBS’ produced in the intervening period had flaws that could have been prevented had these sheets been properly trialled at the workplace using the Job Instruction method. A procedure with guidelines for drafting JBS was produced, but this was no substitute for the first hand experience to be gained from testing draft JBSs in the field using JI.

The researcher would recommend that all the organisational leaders take part in a job instruction session. This would help to excise their old beliefs about what constitutes training, explain the JI process and set a much higher level of expectation for training.

The proper application of the Job Instruction method by the new workplace trainers was not being checked regularly leading to varying standards of instruction on the shop floor. Job Instruction is essentially standard work for trainers and needs to be audited accordingly. A quality control process is being introduced to continually evaluate JI trainers to ensure adherence to the technique, consistency of results and to guide individual's skill development.

Determining the one best way to do a task can sometimes be a very time consuming task requiring a methodical problem solving approach which involves the drawing of considerable technical support. For this reason the drafting of JBS is being recognised as a skill that must not be restricted to the trainers but encompass anyone concerned with documenting changes to standard work such as countermeasures arising out of structured problem solving.

People without even a basic level of JI training should not be attempting to produce Job Breakdown Sheets. This would be simple copying without understanding. Anyone going to write a JBS should be trained in JI first, so they appreciate the subtleties of what they are trying to achieve. Otherwise the resulting shortfall may detrimentally impact training effectiveness and compromise the delivery of critical content.

LRNR is still developing the ground rules for how JI and specifically JBS' fit in to the ISO system. At the moment JBS are controlled reference sheets listed in the relevant SOP. The JBS and SOP co-exist on the basis that they must not contradict each other. The SOP is still the one listed in employees training requirements plan with the JBS being considered part of the SOP.

The fact that the above questions have arisen is not unexpected given that this implementation was undertaken without the guidance of a Master Trainer or participation

in 'Train the Trainer' course. There is no doubt that a Master Trainer's experience may have softened the learning curve, but as in the guiding ethos of TWI, LRNR seeks to 'Learn by Doing'.

## **CONCLUSIONS:**

A rigorous approach to training such as JI, is a vital component in any company's transition toward standard work. It is their best outlet for tackling variance at source thus reducing the burden to detect, analyse and resolve production issues. Training heavily influences employees' perception of the company and sets the first marker for the development of a work culture. JI has been proven to reduce the fear, anxiety and stress generally associated with training, producing a more conscientious, knowledgeable and receptive employee.

The quality of Job Instruction improves with ongoing practice of the method and the development of the trainer's skill set. Mirroring the thrust of Liker and Meier (2007) the focus should always be on developing a deep and lasting capability in the people and organisation, not the speedy propagation of the technique. This learning process, though slow and purposeful, will fundamentally change how the company, not just the trainer, thinks about their work.

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