Using TOC to boost Lean Organisations

Presented By: Philip Marris – CEO Marris Consulting, Paris, France

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The speaker: Philip Marris

- He started his TOC journey in 1986 when he joined Creative Output France and worked with Eli Goldratt.
- CEO of a management consultancy based in Paris France focused on industrial operations.
- 80% of the firm's projects are based on TOC.
- Author of the French reference book *Le Management Par les Contraintes*.
- Founder of the LinkedIn "TLS - TOC Lean & Six Sigma" group.
- Member of the TOCICO French Regional board.

The case study concerns one of the Leanest organisations in the world

- One of the 10 largest automotive OEM suppliers in the world
- Was one of the first to begin it's Lean journey after Toyota at the end of the 1970s
- All the Lean techniques or used : SMED, PDCA, 5S, ppm, Andon, Poka Yoke, Kanban, VSM, VSD, 8D, …
- They are an example of Lean Management
- Good strategy, strong growth, good profits
- Over 100 factories all over the world

The factory of this case study is located in Mexico and produces car alternators

- Production of car alternators for the American continent
- Over 1 000 people

Mid 2011, the factory was in great difficulty

- An excellent product development program generated strong demand for their products
- The automotive market demand of the American continent was much greater than over the previous 3 years
- As a result factory was hopelessly overloaded
- Due date performance became a big issue
- Emergency freight (airplanes) costs soared
- One of the main automakers sent a resident team to the factory to put 24h x 7 day pressure on the facility
- The people in the factory were very stressed

Desperate, they decided to inject some TOC into their Lean

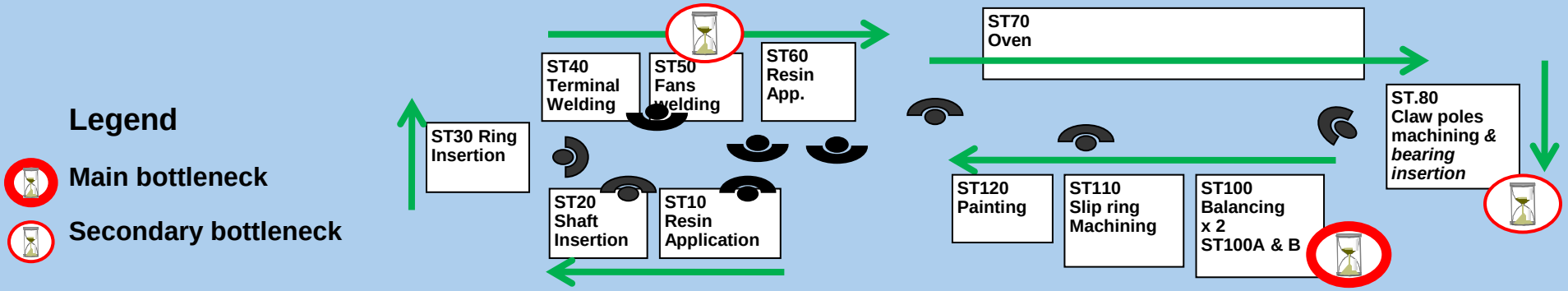
- They had done all they could:
  - Over 10 of their best production managers added to the staff
  - Very fast investment to double the plant ’s capacity
  - Additional direct labour added until you could not fit an extra person into the production line
- They were being threatened by their largest clients
- So…with very mixed feelings among the top management …
- …they decided to inject some TOC into their xPS

Step 1: Identify the bottlenecks

- The plant had over 20 APUs (Autonomous Production Units) of about 10 people per shift
- 3 of them were identified as bottlenecks

We will focus on one of the bottleneck APUs

- Daily production 6 000 units per day = cycle time 15 seconds
- The system is standard Lean: One piece flow, the O.E.Es are approximately 70%, Quality is O.K.
- The bottleneck was already formally identified



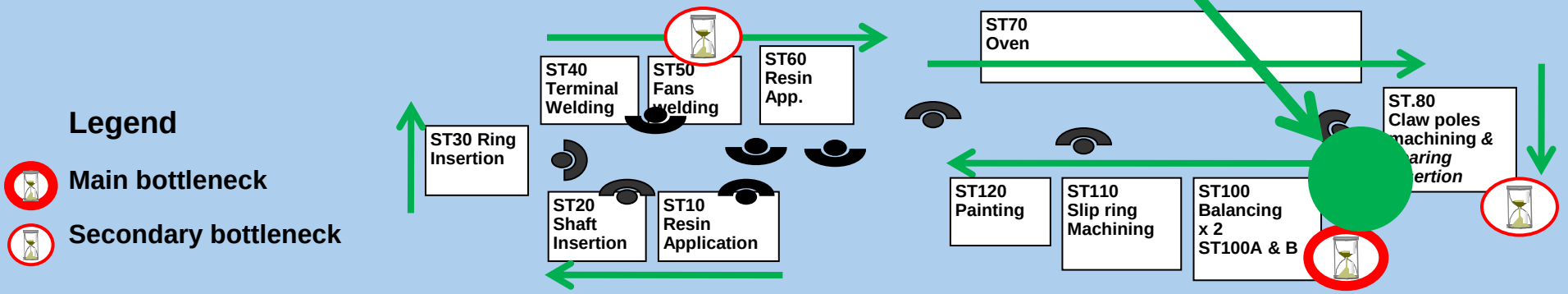
A question!

- **How can we increase Throughput by more than 15% in less than 15 minutes!?**

The solution: protect the bottleneck with a buffer!

- A buffer initially of about 12 parts was implemented just in front of the bottleneck operation
- This protected the bottleneck from micro stoppages lasting between 1 second and 3 minutes
- This immediately increased the Throughput by 17%
- Also from that moment onwards we were able to convincingly mobilize the whole team to adopt the rule « The bottleneck must never stop » and begin a focussed improvement process

The power of the Buffer in the DBR (Drum Buffer Rope)



In the following week we went further

On the bottleneck:

- Production 24 hours per day (really!): the shift change-overs, the lunch breaks, the 5 minute shift meeting, … This was accomplished by increasing the buffer at various times in the day: 4 baskets of parts representing 30 minutes of production time + one bottleneck operator out of the team of 10 people in the APU (each operator in turn)
- Solving the little simple frequent stoppages
- Maintenance priority (preventive and curative)
- Process improvements (even if less than 0.2 seconds).
- Etc.

In the following week we went further

On the non-bottlenecks:

- Scrap & quality improvements
- Reduction in machine downtimes of more than 1 hour
- Etc.

- Remark: There is a tendency to underestimate the importance of non-bottlenecks when practicing TOC on the shop floor.

Lessons learnt

- You need to be very good at Lean to be credible with TOC in such an environment
- Very Lean organisations hate to break the golden rule of « one piece flow » … but they really should. A system should be buffered according to its imperfections
- The system had a radical effect on reducing the level of stress; the APU was in a much better environment to stop and think about possible improvements
- Until Toyota integrates TOC it will be an uphill battle … they are the reference

Other lessons learnt

- It is best to learn the local language
- You need to build excellent shop floor relationships
- You need to seem to say yes from time to time to anti-TOC / very Lean principles such as one piece flow (!)

Final conclusion

- If there are not enough simple & basic TOC success stories that are promoted every month and all over the world there is a risk that the rest of the Theory Of Constraint's ideas will not find a public outside of the TOC community.

Thank you for your time

- Questions or remarks please!?

Annexes

Biography, Abstract, TLS

Biography of Philip Marris

- He started his TOC journey in 1986 when he joined Creative Output France and had the honor and pleasure of working with Eli Goldratt and Issi Pazgal.
- Philip Marris is CEO of Marris Consulting, a management consultancy based in Paris France focused on industrial operations. 80% of the firm's projects are based on TOC.
- He is the author of the French reference book *Le Management Par les Contraintes en gestion industrielle*.
- He is involved in the "TOC + Lean" movement and founder of the LinkedIn "TLS - TOC Lean & Six Sigma" group. He has designed, sold and executed over 90 transformation projects.
- He is a member of the board of the recently created TOCICO French regional group and is active in increasing the awareness of TOC in Europe.
- Philip Marris was in charge of Manufacturing Operations in France and the "Rest Of the World" (Europe, Asia, Africa but excluding the US) in large consulting firms.
- He has over 29 years of experience in industry and in consulting. Philip Marris started his career as a production engineer in the steel industry in the north France.
- He is English and is bilingual and bi-cultural.
- www.marris-consulting.com

Abstract

- TOC focuses an organization on its bottlenecks and proposes to buffer them from upstream problems so that they will not waste their capacity waiting for material to work on. Just this small part of the overall TOC reasoning is a very powerful way to show a company that practices “Lean only” why they should inject some TOC into their approach.
- We will present a 2011 case study of a factory in Mexico of one of the leanest and biggest automobile tier one suppliers in the world in which for instance throughput was increased by 17% in 1 hour on the pilot production line and over 25% in 2 months for the 1000 person plant.
- Those results convinced the firm to integrate TOC into their X Production System that was previously pure Toyota style Lean.