



Association of Rotation Molders
Annual Meeting
October, 2014

Presenter: Ron Funk



Presentation agenda:

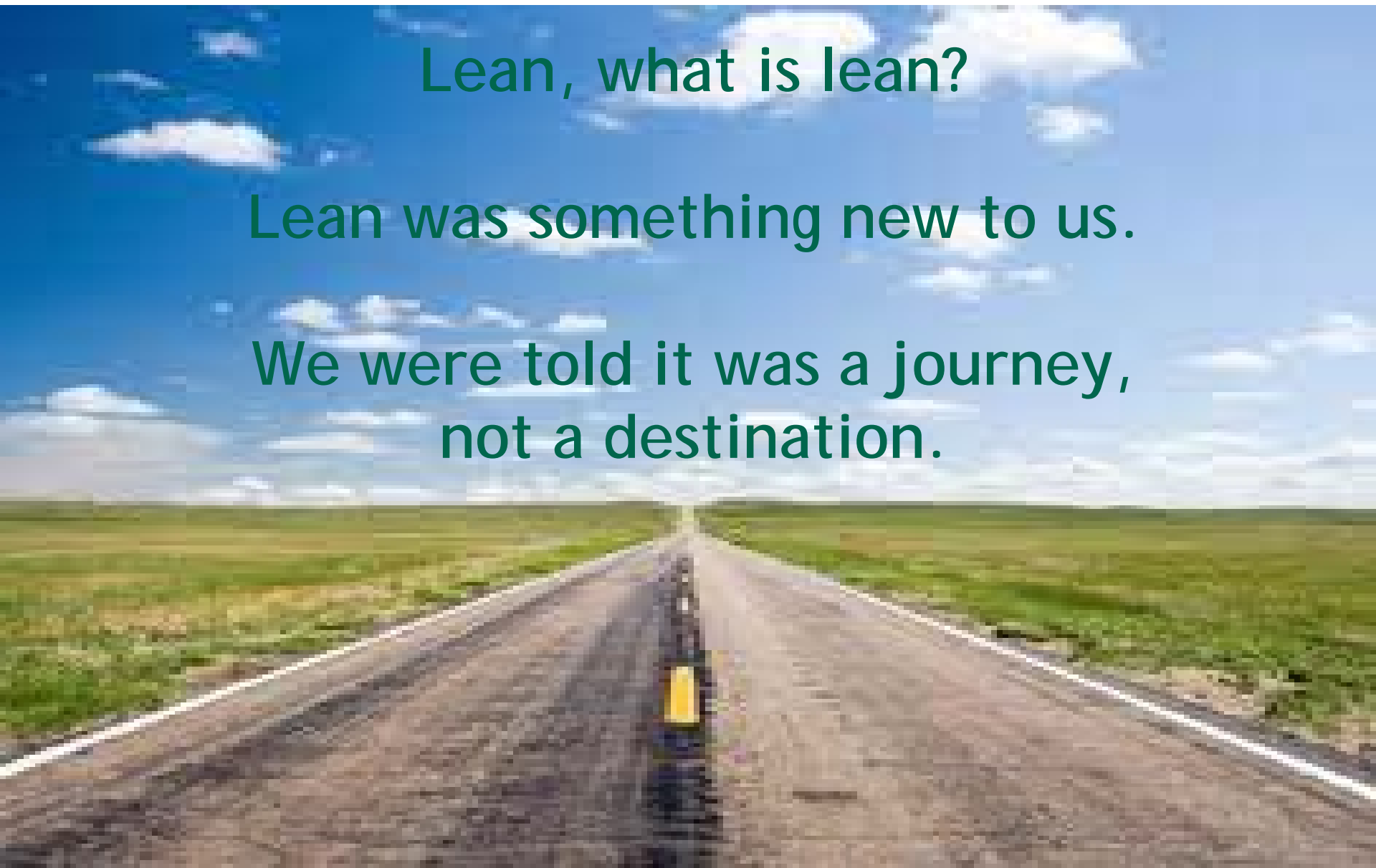
- **Short story of our Lean Journey to October 2014**
- **Explain one of our first lean projects in 2006**
- **Samples of some before and after projects completed since then**
- **Summary**

Lean Journey - 2006 - 2014

Lean, what is lean?

Lean was something new to us.

We were told it was a journey,
not a destination.





**Acrylon Plastics produces playground slides
and playground elbows**





Even the Obama family supports Acrylon





Early on we were very good at “batching” parts.



- » 24 hours per day molding.
- » 8 hours per day trimming by hand.





**Producing parts all weekend without trimming
created havoc on Monday morning.**



» Time for a “Kaizen Blitz”.



» Economical automation.

» Implemented a “one piece flow” process.

» Built shipping racks.



5S Plant Entrance



← **Before**

After →

- » Employees enter with pride.
- » Customer's first impression.



SOP (Standard Operating Procedures)

Standard Operating Procedure

Loading and Running Programs

CNC 0 14-Sep-11

- Setting Up Tools**
Using the Specification Sheet, review the tools you will need for the program you are going to run. Use the Tool Change Operating Procedure to measure the tools and putting the tools into the CNC.
- Loading Programs**
Back in the CNC screen, press the Main Menu button.
Next, select the Edit menu (F3).
- Loading Programs (Continued)**
At the next screen using the arrow keys, find P000500 <CNC#0 X TABLE> and press Enter to open it.
- Loading Programs (Continued)**
Using the arrow keys, move the yellow bar down to the line of code that has the old program number in it.
- Loading Programs (Continued)**
Select Modify (F2).
At the bottom of the screen the line of code that you had selected is ready to be modified. Move the white line over to the program # and change the old program to the new program using the keyboard on the CNC.
- Loading Programs (Continued)**
If an error was made while typing in the new program number press the Esc button TWO times and repeat Step 10.

Standard Operating Procedure

Starting And Running The Pulverizer

INTO BOX/BIN 03-Jan-12

- Turn On Main Power**
At the back of the machine there is a panel that looks like this.
Flip the MAIN POWER switch to the ON position. The orange light should turn on.
- Turn Vacuum Loader On**
On the same panel at the back of the machine...
Flip the VACUUM LOADER switch to the ON position.
Turn on the Pressure Pump ONLY if hopper is being used to blow into silo.
- Silence Alarm (If Needed)**
Sometimes when you turn the Main Power or the Vacuum Loader on, an Alarm will go off. There is a panel to the right of the previous panel that has an Alarm Reset button. Press that to shut the Alarm off.
- Turn On The Dust Collector**
On the right-hand side of the Pulverizer you can find the Dust Collector panel. Simply press the Green Start button to turn it on.
- Turn Other Main Power On**
At the front of the machine there is a bigger panel that has lots of buttons and switches. First, turn the big black switch to the ON position.
- Turn Off Emergency Stop Button**
On the same panel, located the Power button which looks and acts like an Emergency Stop button. Rotate it clockwise to turn the power on.

Note: Turn it the direction of the arrow on the button

Standard Operating Procedure

Startup Procedures CNC 0 and CNC 4

27-May-11

- Turn Machine ON**
In the back of the CNC find the main power switch. Turn to the Right to turn the machine on and wait for computers to boot up.
- Go to Windows Screen**
These Quintax machines have a regular computer AND the actual CNC's computer. To switch between them use this button.
- Enter Password for Network**
Every time the computer is shutdown it is logged off from the network. You need to re-connect. It will ask you for a password. The password is always the CNC's number. For example, CNC 4's password would be "cnc4". Press Ok to login.
- Open WinDNC**
If Windows doesn't already open the WinDNC program for you, you will find a shortcut to open this program on the desktop. You NEED this program open or else your computer can't communicate with the CNC.
- Reference Search/Homing**
You will need to be in Main Menu. In this Menu, choose the Jog Menu using the F buttons. The buttons are in order below the Menu list. For Jog you would press F4.
- Reference Search/Homing (Continued)**
Select Reference Search (F1).
Next, select All Axes (F7).

Standard Operating Procedure

Testing Re-Grind

30-May-12

- Turn Oven ON**
Turn the Temperature Dial on the Oven up to 450°.
- Mold Release Pans**
Before putting any plastic in the Pans, spray each Pan with Mold Release so that the plastic will not stick to it when baking.
- Get Plastic Sample From Re-Grind Bin**
Using a Knife, cut the strap holding the Bin full of Re-Grind together.
Remove the lid from the Bin and push the Probe all the way to the bottom of the Bin full of Re-Grind.
Note: Try to get Probe in CENTER OF BIN.
- Get Plastic Sample From Re-Grind Bin**
When the Probe is all the way down into the Bin, turn the top of the Probe until the "P" and the "T" line up. This will Open the holes on the side of the Probe to let plastic into Probe.
- Label And Close Bin**
With a Marker, write the next number on the Bin you just tested. The example below shows that the Bin # is 84. This is for recording if the Bin is GOOD or BAD later in the process.
- Label And Fill Pan**
So you do not get confused later, place a Sticker on the pan with the same number that you just took the Plastic Sample from.
Dump the plastic out of the TOP of the Probe into the Pan.
Note: After all of the plastic is dumped into the Pan, spread it out so there is an even layer across the whole Pan.

Assists us with language barriers.

Before

Maintenance Shop Kaizen



After

We gained 70% in usable floor space



5S on Production Equipment

- Everything has it's place
- No extra tools - only what you need at point of use
- Provide all the tools required
- Angled shelving to accumulation of unwanted clutter

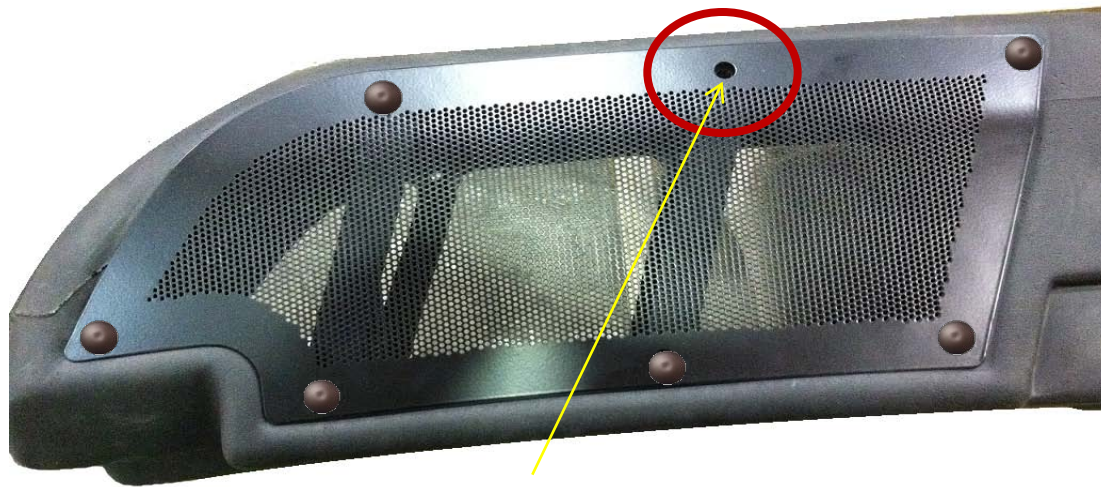


- » Recycled Broom Holders
- » 1 Piece flow for rotomolded parts using a roller system
- » Clean bright lights



Poka-Yoke – “Mistake proofing”

Problem: sending unassembled parts



(Missing Xmas tree clips)

Solution: Use “Lean” problem solving tools

5 Whys

cnh ptf84541199

Feb. 19, 2013

| Effect | Potential causes | | | | | Action |
|--|---|---|--|------------------------------------|---|---|
| | 1-Why | 2-Why | 3-Why | 4-Why | 5-Why | |
| Trimmed and Assembled parts put into the same box during assembly - left untrimmed part in box when shipped to customer. | When assembled box is full, but untrimmed is not - assembled parts are put into assembled box, until all are trimmed and assembled. | Saves time / convenience | By putting untrimmed and assembled parts into the same box, don't have to get another box. By getting another box you would have 3 instead of two boxes (space issues). By using two boxes only - avoid extra trips getting untrimmed box... Bring completed away. | | | Put untrimmed parts in plastic tubs only. Trimmed/assembled parts into paper Gaylord boxes only. |
| Shipped some untrimmed parts - bypassed CNC and assembly. | Bypassed trim, assembly and packaging to the warehouse. | No storage space inside. | To much W.I.P. In CNC area. | Could not keep up with trimming. | Priority of orders - Machine down, employees missing. | |
| CNC operator unfamiliar with trim and assembly procedure for this part. | 1) Lack of work on CNC familiar to Operator. 2) People coming on to make up their 8 hrs. | Operator required, and they were available. | Lack of staff. | Increased workload - large orders. | | Ensure all operators are properly trained for specific parts, when moved to a CNC where they are not familiar with the parts. |
| Not identified as untrimmed or completed. | No documented procedure. | Tribal knowledge. | | | | Clear documented procedure (SOP), including training. |

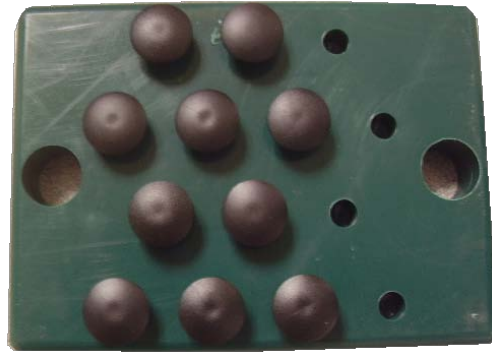


| ACRYLON PLASTICS | | A3 Template | |
|---|--|--|--|
| Background: Part# 84541199 (Dirty Air Duct). Part(s) shipped to CNH, not trimmed / assembled. | | Title: RE: CNH SQP #2013000014294, #2013000014302 Date: Feb. 19-13 Team: Ron F, Richard U, Brad W, Franz O, Tracy J, Corrie H, Alex Z | |
| (1) Clarify the Problem: 3 SQPs received (23 parts total), since Feb. 14, 2012. Current 2 SQPs (8pcs total) 7,709 made (31pcs rej) since Feb. 1, 2012 to current. Defect Rate: 4% (4,021 ppm) <ul style="list-style-type: none"> All 329 completed parts (in-house,) were inspected - no issues found. SCSI- Supply Chain Services International, inspected CNH inventory (811 pcs)... no additional non-conforming parts were found to the original 8pcs. | | (4) a. Develop Solutions / Countermeasures: Actions resulting from 5 why analysis: 1) Put untrimmed parts in plastic tubs only. Trimmed/assembled parts into paper gaylord boxes only. | |
| (2) Breakdown the Problem and Set Target: Target, 500ppm | | (4) b. Implement Counter measures: 1) Develop/modify (SOP) - molding to poka. Mark F, Feb 22-13 (completed - see attached) 2) Train molding/CNC/assembly/shipping personnel on new/modified (SOP). Richard U Feb 22-13 (completed - see attached) 3) Ensure all operators are trained for specific parts when moved to a CNC they are not familiar with. Richard U, On-going | |
| (3) Root Cause Analysis: Results from 5 why process. <ol style="list-style-type: none"> Trimmed and Assembled parts put into the same box during assembly - left untrimmed part in box when shipped to customer. Shipped entire box of untrimmed parts - bypassed CNC and assembly. CNC operator unfamiliar with trim and assembly procedure for this part. Not identified as untrimmed or completed. | | (5) Evaluate Results and Process: Evaluate - Corrie H March 31-13 1) Put untrimmed parts in plastic tubs only. Trimmed/assembled parts into paper gaylord boxes only. | |
| | | (6) Standardize Processes: Made SOPs Trained people | |
| | | (7) Draw Conclusions (Hansei & Yokoten): Poka-Yoke works on even simple things that you think people shouldn't forget | |

EMAILED
FEB 25 2013
FAXED

Poka-Yoke – “Mistake proofing”

Solution: Implement solutions



Trays for correct # of Xmas tree clips

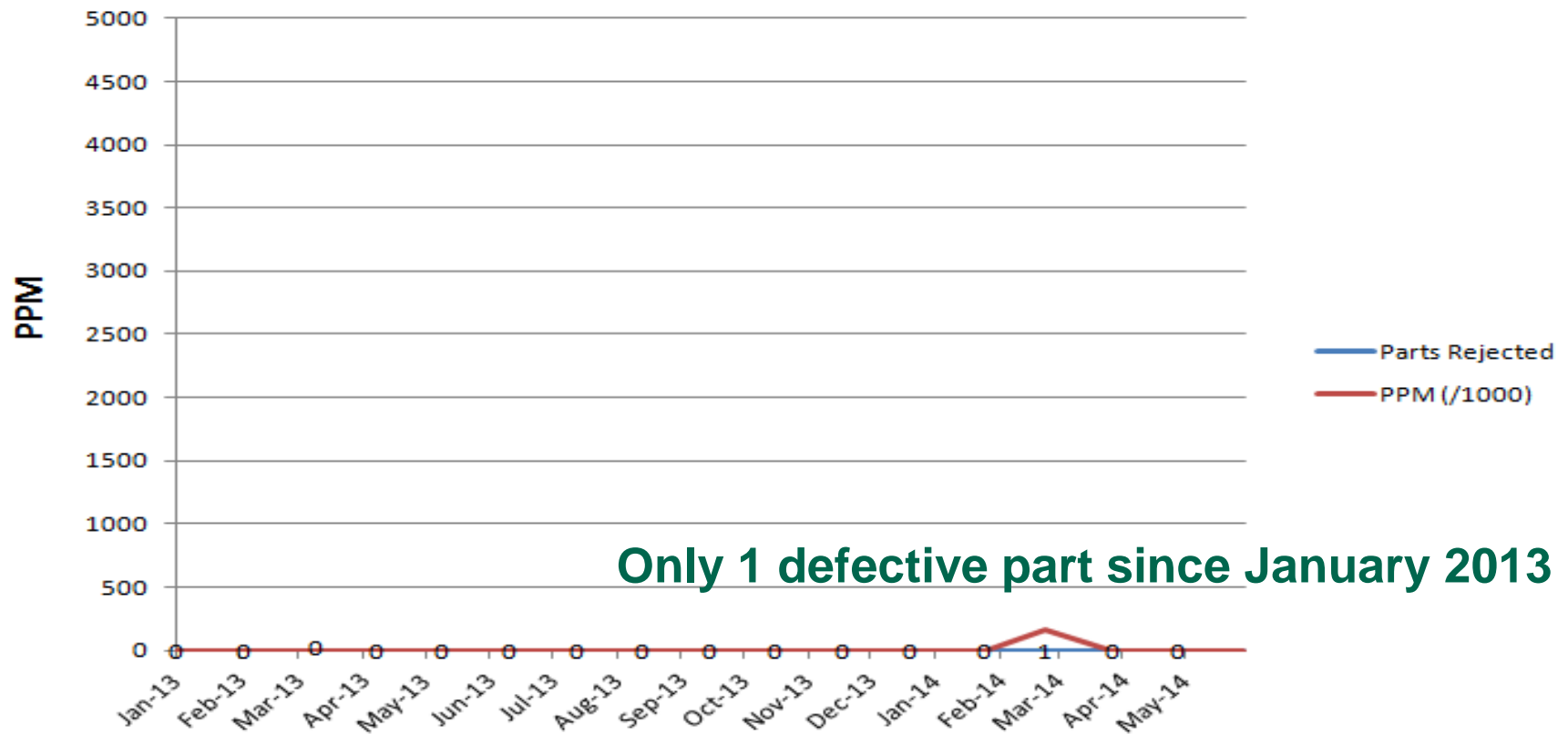
- » Build stands for trays
- » Create SOP and Train employees

| Standard Operating Procedure | | Foam/Xmas Tree Clip Preparation |
|--|--|--|
| | | 22-Feb-13 |
| <p>1 Xmas Tree Clips Into Trays Take an empty tray, and put 14 Xmas Tree Clips into the holes</p> <p>X14</p> | <p>2 Stack Trays & Foam Stack the Trays and Foam pieces as shown in the picture</p> | <p>3 Stack 5 High There should be 5 Trays, and 5 Foam Pieces in total for each stack</p> <p>5/each</p> |
| <p>4 "Lid" Place the plastic "Lid" on top of the stack</p> | <p>5 Locking Pins Use 2 Locking Pins to secure "Lid" to stack</p> | |



Poka-Yoke – “Mistake proofing”

Results: Virtually eliminated defects since Poka-Yoke was implemented



Last updated May, 2014



Presentation summary:

- 2006 we started to implement some “Lean” strategies.
- Today most Acrylon employees have a minimum of “Lean 101” training.
- Creating a “Lean” culture is important to us and a large part of our future success.



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Thank you for your time