5TH OCTOBER 2016

Servo Press Technology
& Return on Investment

By Barry Lewalski
Sales & Product Manager  Servo Press Systems
SERVODIRECT TECHNOLOGY

OVERVIEW

• DIFFERENCES BETWEEN CONVENTIONAL AND SERVO PRESS TECHNOLOGY

• FEATURES AND BENEFITS OF SERVO PRESSES

• COMPARISON OF STROKE PROFILE

• CASE STUDIES AND RESULTS
SERVO DIRECT TECHNOLOGY

DIFFERENCES COMPARED TO CONVENTIONAL

**Mechanical Press**
- No clutch / brake assembly
- No flywheel
- Less efficiency

**Servo Press**
- Highest motor efficiency
- Speed of press is Programmable
- Programmable stoke length

*Flywheel drive*

*ServoDirect drive*
SERVO DIRECT TECHNOLOGY

DRIVE CONCEPT

- Direct drive concept
- Use of **highly dynamic torque motors**
- Time-travel profiles are user-programmable
- Setup and tryout functions
- Stroke length is user-programmable (pendulum motion)
PREVIEW

ADVANTAGES OF SERVO PRESS TECHNOLOGY

- **Servo Motion Increases SPM Output**: by adjusting stroke lengths and slide motion curves.
- **Maximum production flexibility**: by optimizing the process and forming motion curves.
- **Shorter setup times for toolings**: by using the features of the servo tryout function.
- **Increase part quality and die lifetime**: through optimization of the forming process.
- **Lower energy costs**: through an efficient energy management system.
- **Lower costs per part ratio**: by increasing the spm part output.
SERVO DIRECT TECHNOLOGY  VS CONVENTIONAL PRESS FULL STROKE
PENDULAR MOTION FOR INCREASED PRODUCTION RATE

Servo Press pendulum motion
- Cycle time = 1.7 s
- Stroke rate = 35 spm = 133%

Servo Press full stroke
- Cycle time = 2.3 s
- Stroke rate = 26 spm = 73%

Conventional Press full stroke
- Cycle time = 4 s
- Stroke rate = 15 spm = 100%

Servo Pendular Motion
Reversing rotating motion of the drive

Full stroke
Complete rotating motion of the drive
PRACTICAL EXPERIENCE  :  250 - 800 TON

INCREASED PRODUCTION RATES WITH EXISTING PROGRESSIVE DIES

<table>
<thead>
<tr>
<th>Formed part</th>
<th>Operating mode</th>
<th>Press force [kN]</th>
<th>Drawing depth [mm]</th>
<th>Max. stroke rate Conventional [spm]</th>
<th>Max. stroke rate Servo [Spm]</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flange</td>
<td>Progressive</td>
<td>2,500</td>
<td>30</td>
<td>30</td>
<td>56</td>
<td>87 %</td>
</tr>
<tr>
<td>Gas generator holder</td>
<td>Progressive</td>
<td>2,500</td>
<td>60</td>
<td>25</td>
<td>40</td>
<td>60 %</td>
</tr>
<tr>
<td>Holder</td>
<td>Progressive</td>
<td>2,500</td>
<td>40</td>
<td>30</td>
<td>60</td>
<td>100 %</td>
</tr>
<tr>
<td>Cage</td>
<td>Progressive</td>
<td>4,000</td>
<td>50</td>
<td>30</td>
<td>50</td>
<td>67 %</td>
</tr>
<tr>
<td>Gripper rail drive unit</td>
<td>Progressive</td>
<td>8,000</td>
<td>65</td>
<td>20</td>
<td>40</td>
<td>100 %</td>
</tr>
</tbody>
</table>
PRACTICAL EXPERIENCE: 1,100 – 2,500 TON

INCREASED PRODUCTION RATES WITH EXISTING TRANSFER & PROG DIES

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover</td>
<td>Progressive</td>
<td>11,000</td>
<td>40</td>
<td>15</td>
<td>34</td>
<td>126 %</td>
</tr>
<tr>
<td>Center console</td>
<td>Transfer</td>
<td>11,000</td>
<td>190</td>
<td>12</td>
<td>17</td>
<td>42 %</td>
</tr>
<tr>
<td>Insert cup</td>
<td>Transfer</td>
<td>11,000</td>
<td>130</td>
<td>8</td>
<td>15</td>
<td>88 %</td>
</tr>
<tr>
<td>Cross plate</td>
<td>Progressive</td>
<td>16,000</td>
<td>90</td>
<td>23</td>
<td>33</td>
<td>43 %</td>
</tr>
<tr>
<td>Tank filler neck</td>
<td>Transfer</td>
<td>16,000</td>
<td>145</td>
<td>14</td>
<td>18</td>
<td>29 %</td>
</tr>
<tr>
<td>Side panel</td>
<td>Transfer</td>
<td>16,000</td>
<td>80</td>
<td>19</td>
<td>29</td>
<td>53 %</td>
</tr>
<tr>
<td>Geared ring</td>
<td>Transfer</td>
<td>16,000</td>
<td>45</td>
<td>15</td>
<td>21</td>
<td>40 %</td>
</tr>
<tr>
<td>Seat part</td>
<td>Transfer</td>
<td>25,000</td>
<td>130</td>
<td>16</td>
<td>24</td>
<td>50 %</td>
</tr>
</tbody>
</table>
ServoDirect Technology: Transfer or Prog-die?
SERVODIRECT TECNOLOGY: TRANSFER OR PROG-DIE?

AGENDA

• ADVANTAGES OF BOTH TRANSPORT PRINCIPLES

• REQUIREMENTS ON PRESS-LINE LAYOUT

• DECISION MAKING PROCESS

• IMPORTANCE OF HIGHEST FLEXIBILITY

• CONCLUSION
TRANSFER – PROGDIE COMPARISON OF THE ADVANTAGES

- Part can be rotated
- Part can be tilted
- Less material usage
- Different feeding pitches
- Different lifter strokes
- Flexibility ➔ Usage of Coil / Blank material
- Higher stroke rate
- Shorter die start-up
- Part surveillance is easier
- Installation and removal of die is easier, faster
- Design is less focused on interference curves
PRESS-LINE COMPONENTS

NECESSARY PRESS-LINE EQUIPMENT

Transfer

Blank Material

Shear cutting

Die integrated Cutting

Progdie

Coil Material
DECISION MAKING PROCESS

THERE IS ONE AND ONLY ONE RESPONSIBILITY OF BUSINESS: TO USE ITS RESOURCES AND ENGAGE IN ACTIVITIES DESIGNED TO INCREASE ITS PROFITS SO LONG AS IT STAYS WITHIN THE RULES OF THE GAME. — MILTON FRIEDMAN, ECONOMIST; 1976 NOBEL PRIZE IN ECONOMIC SCIENCES

DIE COSTS

+ MATERIAL COSTS

+ STROKE RATE - NET

= PROFIT

PROFITABILITY Is achieved and increased through an total view on the machine and die technology based on apropiate machine settings.
APPROPRIATE FORMING PROCESS USING CONVENTIONAL TECHNOLOGY

PROCESS OPTIMIZATION IN THE PRE-SERVO AGE

EXCENTRIC DRIVE  DRAW LINK DRIVE  CUTTING LINK DRIVE  LINK DRIVE WITH SLIDE STROKE ADJUSTMENT

→ NO FLEXIBILITY AND RIGID PROCESS CHARACTERISTIC

Slide stroke characteristic determined and fixed through the mechanical drive design
PROCESS-FOCUSED VIEW ON SDT SERVO PRESS TECHNOLOGY

OPTIMIZED PROCESSES THROUGH SDT SERVO DRIVE

SDT SERVO DRIVE

⇒ HIGHEST FLEXIBILITY AT OPTIMAL PROCESSES

Slide stroke characteristic and stroke height is freely programmable

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CONCLUSION: FOR BEST RETURN ON INVESTMENT

- Optimal match of the process, material and part shapes.
- Production at the highest possible rate
- Transfer or Progdie decision is made based upon the most profitable process

SERVO TECHNOLOGY

Decision for a flexible press line
5TH OCTOBER 2016

SERVO TECHNOLOGY

Die Design for Servo Presses
DIE DESIGN FOR SERVO PRESSES

AGENDA

• REASON FOR NEW NEEDS ON DIE DESIGN

• EFFECTS WITH PENDULAR STROKE

• EFFECTS THROUGH HIGHER VELOCITY

• IT-TOOLS FOR DIE-DESIGNERS

• TRANSPORTATION SIMULATION WITH DIGISIM

• CONCLUSION
REASON FOR NEW NEEDS ON DIE DESIGN

- HIGHER OUTPUT
- PROFITABLE PROCESS FOR TRANSFER OR PROGDIE ON THE SAME MACHINE
- PROGRAMMABLE SLIDE VELOCITY FOR THE FORMING AREA TO IMPROVE PART QUALITY AND REDUCE DIE WEAR AND HEATING
REASON OF HIGHER OUTPUTS WITH SERVO TECHNOLOGY SDT

Conventional Technology

- Stroke rate can be changed

Servo Technology

- Adaptable slide stroke height = pendular mode
- Adaptable slide velocity
OUTPUT INCREASE AT SERVO PRESSES

1. **PARTIAL CUSTOMIZED SLIDE VELOCITY**
   ➔ PROCESS-BOTTLE NECK DOES NOT DEFINE THE MAXIMUM SPEED FOR THE WHOLE PROCESS

![Diagram showing race track comparison between conventional and servo presses.]
SERVO-DESIGNED DIES

1. PRINCIPLE – GUIDANCE PILLAR LENGTH ON THE SAME LEVEL ➔ AS SHORT AS POSSIBLE

2. PRINCIPLE – GRABBING HEIGHT OF THE PART ON THE SAME LEVEL
EFFECT OF THE PENDULAR MODE ON CLEARANCE

- Higher output
- Less clearance
- Dies design enabling lower stroke heights

- Pendular stroke = 300mm slide stroke
- Fulls stroke = 700mm slide stroke
CONCLUSION – DIE DESIGN.

SERVO DIE DESIGN CONSIDERS:

• Reduction of guidance length

• Reduction of mass

• Damped moveable elements

• Usage of standard parts bearing higher velocities

• Interference curves for the specific forming part

SCHULER PROCESS SUPPORT...

...Increase performance and higher outputs
5th October 2016

SERVO PRESS TECHNOLOGY & RETURN ON INVESTMENT

Part Analysis and Part Cost
AGENDA

PROCESS MANAGEMENT – HOW WE CAN SUPPORT

IDEAL PART AND PRODUCTION PROCESS

PART CALCULATION

ECONOMIC EFFICIENCY AND PROFITABILITY
THE SCHULER SUPPORT PACKAGE

Consulting

Part Calculations

IT-Solutions

Production Die testing

Tool Tryout and Start Up – Back-Up Production

Production Support

Process Optimization

Training and Workshops

Aug 19th 2016  Part Analysis and part Cost
EFFICIENT PROCESS CHAIN

- Ideal Part and production process
- Optimum Die design and simulation
- Increase of availability
- Optimization of set up times
- Increase of employees qualification
- Energy saving
- Optimization of strokes / min

Aug 19th 2016  Part Analysis and part Cost
AGENDA

PROCESS MANAGEMENT – HOW WE CAN SUPPORT

IDEAL PART AND PRODUCTION PROCESS

OPTIMUM DIE DESIGN AND SIMULATION

OUTPUT OPTIMIZATION

ECONOMIC EFFICIENCY AND PROFITABILITY
## BASIC DATA OF SAMPLE PART

<table>
<thead>
<tr>
<th>Material</th>
<th>DC04</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>900 x 900 x 50</td>
</tr>
<tr>
<td>Thickness</td>
<td>1.5</td>
</tr>
<tr>
<td>Production quantity per year in piece</td>
<td>500,000</td>
</tr>
<tr>
<td>Material costs per metric ton in</td>
<td>$ 750</td>
</tr>
</tbody>
</table>

---

Aug 19th 2016   Part Analysis and part Cost

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STEP 1: FEASIBILITY STUDIES, METHOD PLANNING

PROCESS EVALUATION AND DECISION-MAKING PROCESS

- Is the part producible?
- Which processes are necessary?
- How many operations and die stages are required?
- Is the integration of a subsequent process possible?
- How important are material costs and savings?
- Targeted production costs per part?
  - Hand operated or automated production?
  - Transfer or ProgDie process?
STEP 2: CALCULATION OF THE REQUIRED PRESS FORCE

### Forming force

<table>
<thead>
<tr>
<th>Customer</th>
<th>XYZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part</td>
<td>sample part</td>
</tr>
<tr>
<td>Process</td>
<td>transfer</td>
</tr>
<tr>
<td>Size</td>
<td>900 x 900 x 50 [mm]</td>
</tr>
<tr>
<td>Material</td>
<td>DC04</td>
</tr>
<tr>
<td>Tensile Strength</td>
<td>360 N/mm²</td>
</tr>
<tr>
<td>Code Material</td>
<td>ST</td>
</tr>
<tr>
<td>Thickness</td>
<td>1.5 mm</td>
</tr>
<tr>
<td>Safety Factor Calculation</td>
<td>1.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OP10</th>
<th>OP20</th>
<th>OP30</th>
<th>OP40</th>
<th>OP50</th>
</tr>
</thead>
<tbody>
<tr>
<td>1680</td>
<td>1092</td>
<td>1470</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1366</td>
<td>0</td>
<td>1092</td>
<td>1470</td>
<td></td>
</tr>
<tr>
<td>1680</td>
<td>1356</td>
<td>0</td>
<td>1092</td>
<td>1470</td>
</tr>
<tr>
<td>695</td>
<td>163</td>
<td>0</td>
<td>131</td>
<td>176</td>
</tr>
<tr>
<td>2016</td>
<td>1822</td>
<td>0</td>
<td>1468</td>
<td>1976</td>
</tr>
</tbody>
</table>

### Calculations

- Drawing force: \( F_{zd} \) [kN]
- Cutting force: \( F_{zm} \) [kN]
- Bending force: \( F_{b} \) [kN]
- Forming force: \( F_{f} \) [kN]
- Spring force / blank holder force: \( F_{s} \) [kN]

### Max. Press Force

Max. press force

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STEP 3: DIFFERENT PRODUCTION PROCESSES

① Hand operated

② ProgDie process

③ Transfer process
## STEP 3: DIFFERENT PRODUCTION PROCESSES (CONVENTIONAL PRESS)

<table>
<thead>
<tr>
<th></th>
<th>Hand operated</th>
<th>ProgDie</th>
<th>Transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Estimated Output in spm</strong> (Basis: Conventional presses)</td>
<td>4</td>
<td>25</td>
<td>20</td>
</tr>
<tr>
<td><strong>Number of presses</strong></td>
<td>5 (each operation)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Production quantity per year</strong></td>
<td>500,000 piece</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Availability in %</strong></td>
<td>70</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td><strong>Shifts per day</strong></td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Production days</strong></td>
<td><strong>149</strong></td>
<td>26</td>
<td>32.5</td>
</tr>
<tr>
<td><strong>One time investment costs</strong></td>
<td>+</td>
<td>-</td>
<td>--</td>
</tr>
<tr>
<td><strong>Material savings</strong></td>
<td>++</td>
<td>-</td>
<td>++</td>
</tr>
<tr>
<td><strong>Personnel costs</strong></td>
<td>--</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td><strong>Maintenance costs</strong></td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td><strong>Die change time</strong></td>
<td>-</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td><strong>Result</strong></td>
<td>-</td>
<td><strong>++</strong></td>
<td>+</td>
</tr>
</tbody>
</table>
### STEP 4: CALCULATION – MATERIAL COSTS PER PART (CONVENTIONAL PRESS)

<table>
<thead>
<tr>
<th></th>
<th>Hand operated</th>
<th>ProgDie</th>
<th>Transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Material costs per ton</strong></td>
<td>$750</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Feed length</strong></td>
<td>1100 (Blanking operation)</td>
<td>1100</td>
<td>1100</td>
</tr>
<tr>
<td><strong>Part weight – Gross</strong></td>
<td>1,25</td>
<td>1,38</td>
<td>1,25</td>
</tr>
<tr>
<td><strong>Part weight – Net</strong></td>
<td>1,163</td>
<td>1,163</td>
<td>1,163</td>
</tr>
<tr>
<td><strong>Cuttings &amp; Scrap material</strong></td>
<td>7%</td>
<td>19%</td>
<td>7%</td>
</tr>
<tr>
<td><strong>Quantity Parts per / t.</strong></td>
<td>800 piece</td>
<td>724 piece</td>
<td>800 piece</td>
</tr>
<tr>
<td><strong>Material costs per Part</strong></td>
<td>$ 0,93</td>
<td>$ 1,04</td>
<td>$ 0,93</td>
</tr>
<tr>
<td><strong>Anual savings on production of 500,000 units</strong></td>
<td><strong>$ 55,000</strong></td>
<td><strong>$ 55,000</strong></td>
<td><strong>$ 55,000</strong></td>
</tr>
</tbody>
</table>

Savings per year for 6 Parts with 500,000 pieces per year each = ~ $ 330,000
### STEP 5: CALCULATION - PRODUCTION COSTS PER PART – CONVENTIONAL PRESS

<table>
<thead>
<tr>
<th></th>
<th>Hand operated</th>
<th>ProgDie</th>
<th>Transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated Stroke rate</td>
<td>4</td>
<td>25</td>
<td>20</td>
</tr>
<tr>
<td>Production quantity</td>
<td></td>
<td>500.000</td>
<td></td>
</tr>
<tr>
<td>Working days per year</td>
<td>149</td>
<td>26</td>
<td>32.5</td>
</tr>
<tr>
<td>Shifts per year</td>
<td>298</td>
<td>52</td>
<td>65</td>
</tr>
<tr>
<td>Availability in %</td>
<td>70</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td><strong>Production costs per Part</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Invest-&amp; Fix-&amp; Variable-Costs</td>
<td>$ 0,32</td>
<td>$ 0,14</td>
<td>$ 0,17</td>
</tr>
<tr>
<td>Material costs per Part</td>
<td>$ 0,93</td>
<td>$ 1,04</td>
<td>$ 0,93</td>
</tr>
<tr>
<td><strong>Costs per Part</strong></td>
<td>$ 1,25</td>
<td>$ 1,18</td>
<td>$ 1,10</td>
</tr>
<tr>
<td>Savings per – 3 to 2</td>
<td></td>
<td></td>
<td>$ 40.000</td>
</tr>
</tbody>
</table>

Annual Savings from Prog Die to Transfer for 6 Parts with 500.000 pieces = ~ $ 240.000
HOW TO INCREASE RETURN WITH SERVO

BY IMPROVING:

- SELECTION OF BEST PROCESSES
- OPTIMIZED DIE AND TOOL DESIGN
- INCREASED OUTPUT SPEED
- REDUCE MAINTENANCE COSTS
- LOWER ENERGY CONSUMPTION

- OPTIMIZED AND SHORTEN DIE CHANGE TIMES
- LESS COSTS FOR PERSONNEL
- INCREASE IN OEE (OVERALL EQUIPMENT EFFECTIVENESS)
RETURN ON INVESTMENT CONSIDERATIONS

MAIN STEPS

1. **INVEST COSTS**
   a) Press
   b) Coil line
   c) Transfer
   d) Additional Equipment

2. **VARIABLE COSTS**
   a) Labor Costs
   b) Maintenance Costs
   c) Energy Consumption

3. **FIX COSTS**
   a) Costs for Used Area
   b) Crane Costs
   c) Forklift & Logistics
   d) Number of write-off years – interest rate
   e) Machine-independent burden costs

4. **PRODUCTIVITY INPUTS**
   a) Number of productive days
   b) Number of productive hours each day
   c) Plant availability
   d) Overall Equipment Efficency (OEE)
   e) Stroke rate – production SPM (result of part calculation)
STEP 6: OUTPUT OPTIMIZATION – SERVO PRESS AND TRANSFER MOVEMENT

**Conventional press**
- Initial situation
- Stroke rate = 20 1/min
- Cycle time = 3,0 s
- Stroke height = 400 mm
- Start forming = 40 mm
- Forming speed = 200 mm/s

**Servo press TSC2-1250**
- Stroke rate = 32 1/min
- Cycle time = 1,88 s
- Stroke height = 400 mm
- Start forming = 40 mm
- Forming speed = 200 mm/s

Cycle time = 1,88 s

60% increase in production rate
### STEP 7: CALCULATION - PRODUCTION COSTS PER PART

<table>
<thead>
<tr>
<th></th>
<th>Conventional Transfer</th>
<th>Servo Transfer</th>
<th>Revenue out of additional production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual parts study result in SPM</td>
<td>20</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>Annual Production 3Sft., 7Hr, 6Dy</td>
<td>2,419,200</td>
<td>3,870,720</td>
<td></td>
</tr>
<tr>
<td>Real production time</td>
<td>80%</td>
<td>85%</td>
<td></td>
</tr>
<tr>
<td>Annual production capacity</td>
<td>1,935,360</td>
<td>3,290,112</td>
<td></td>
</tr>
<tr>
<td>Production quantity</td>
<td>500,000</td>
<td>500,000</td>
<td></td>
</tr>
<tr>
<td>Working days</td>
<td>20</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Production costs per part</td>
<td>$ 0.17</td>
<td>$ 0.11</td>
<td></td>
</tr>
<tr>
<td><strong>Savings with Servo Press based up 12 days production</strong></td>
<td></td>
<td>$ 30,000</td>
<td></td>
</tr>
<tr>
<td><strong>Savings for 6 parts based up 72 days production</strong></td>
<td></td>
<td>$ 180,000</td>
<td></td>
</tr>
<tr>
<td>Additional Parts Produced with Servo during the rest of year</td>
<td></td>
<td>1,354,752</td>
<td></td>
</tr>
<tr>
<td>Percentage more with Servo</td>
<td>70%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net revenue per part</td>
<td>$ 0.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extra revenue for parts produced</td>
<td></td>
<td>$ 162,570</td>
<td></td>
</tr>
<tr>
<td><strong>Additional Annual Return On Investment with servo press</strong></td>
<td></td>
<td>$ 342,570</td>
<td></td>
</tr>
</tbody>
</table>

Having flexible Schuler Servo Press which enables you to select the most cost efficient process Progdie or Transfer - **Addition Return on Investment** $342,570 x 5 yr = $1,712,850
POTENTIAL: RATIONALISATION OPPORTUNITIES

BUSINESS CASE: ONE SCHULER SERVO PRESS REPLACES TWO EXISTING CONVENTIONAL MECHANICAL PRESSES

CONSIDERABLY HIGHER PRODUCTION FLEXIBILITY

➤ LESS PRODUCTION PERSONNEL

➤ REDUCED SPACE REQUIREMENTS

➤ LESS UNPLANNED STANDSTILLS COMBINED WITH CONSIDERABLY REDUCED REPAIR AND MAINTENANCE COST

➤ CONSIDERABLY INCREASED COMPETITIVENESS FOR THE ACQUISITION OF NEW ORDERS
SCHULER AS PARTNER .... FOR SUCCESS IS IN THE FUTURE.
THANK YOU, FOR YOUR KIND ATTENTION!