Instrument obsolescence
Simple solutions for big problems

60 Years providing Solutions to our Clients
Tecnatom owns and maintains six Spanish replica full scope simulators. These simulators are certified by the Spanish Regulatory Body according to the ANSI-3.5.
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Foxboro indicators with nitinol wire

Problem

Persistent misalignments in the indicators due to ageing
Decrease in the indicating range (<80%)
Expensive repair works or replacement (1600€)

Solution

Nitinol mechanism replaced by a servo controlled by an Arduino Uno board
Cost under 100€
Adjustment by USB software programming
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Foxboro indicators with nitinol wire
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Westinghouse rod counter simulation

Problem

Mechanical rod counters are being replaced by digital counters in Plants
Certified nuclear component
High cost (2600€)

Solution

Development of digital counter that simulates the Westinghouse one
Low cost (200€)
Same interface signals
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Westinghouse rod counter simulation

Plant

Simulator
Sound solutions

Problem: High cost of the sound equipment for Site Emergency Plan

Solution: Development of equipment with low cost Arduino and Robertsonic boards, with SD for sound recording

Problem: Difficulty in finding horn replacements with similar sound

Solution: Development of equipment based on Robertsonic boards. Horn simulation
Fixing components

Problem
Failures in digital recorders. High repair costs

Solution
Failure in high voltage regulator found out. Replacement with low cost commercial board

Problem
Multi position switches. Problem with one position

Solution
Design of a device with a button activated by the shaft
# Instrument obsolescence. Simple solutions for big problems

## Total savings

<table>
<thead>
<tr>
<th>Description</th>
<th>NPP</th>
<th>Units</th>
<th>Orig / Rep</th>
<th>Total Orig / Rep</th>
<th>TECNATOM</th>
<th>Total TECNATOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modification of Foxboro indicators</td>
<td>AS</td>
<td>142</td>
<td>1,600 €</td>
<td>227,200 €</td>
<td>100 €</td>
<td>14,200 €</td>
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<tr>
<td>Digital rod counters</td>
<td>AS/VN/AL</td>
<td>36</td>
<td>2,600 €</td>
<td>93,600 €</td>
<td>200 €</td>
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<td>Site Emerg Plan sound equipment</td>
<td>AS/VN/AL</td>
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<td>3,000 €</td>
<td>9,000 €</td>
<td>200 €</td>
<td>600 €</td>
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<tr>
<td>Horn replacement</td>
<td>All</td>
<td>10</td>
<td>300 €</td>
<td>3,000 €</td>
<td>120 €</td>
<td>1,200 €</td>
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<tr>
<td>Digital recorders</td>
<td>AS/VN/AL/CO</td>
<td>8</td>
<td>850 €</td>
<td>6,800 €</td>
<td>60 €</td>
<td>480 €</td>
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<tr>
<td>Adjustment of switches</td>
<td>AS</td>
<td>50</td>
<td>650 €</td>
<td>32,500 €</td>
<td>25 €</td>
<td>1,250 €</td>
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<tr>
<td><strong>Total savings</strong></td>
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<td></td>
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<td>372,100 €</td>
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<td>24,930 €</td>
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<tr>
<td><strong>Total savings</strong></td>
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<td><strong>347,170 €</strong></td>
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