

# Centro de Mecanizados del Cauca



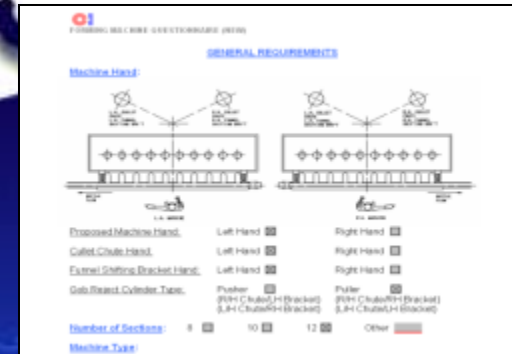
# Ingeniería + Manufactura Global

| A  | B                | C              | D             | E            | F                                            | G  | H | I | J |
|----|------------------|----------------|---------------|--------------|----------------------------------------------|----|---|---|---|
| 1  | IS-10 8.5 T/G    | D/G            | NNPB          |              |                                              |    |   |   |   |
| 2  | 1" RAISED INVENT |                |               |              |                                              |    |   |   |   |
| 3  |                  |                |               |              |                                              |    |   |   |   |
| 4  |                  |                |               |              |                                              |    |   |   |   |
| 5  |                  |                |               |              |                                              |    |   |   |   |
| 6  |                  |                |               |              |                                              |    |   |   |   |
| 7  |                  |                |               |              |                                              |    |   |   |   |
| 8  |                  |                |               |              |                                              |    |   |   |   |
| 9  | CHANGE<br>NOTICE | PART NUMBER    | QTY./<br>UNIT | QTY./<br>ORD | PART DESCRIPTION                             | SP |   |   |   |
| 10 |                  | 015-02701 GR25 | 1/SEC         | --           | SECTION FRAME-FIXED TO-1"R (w/o snap valves) |    |   |   |   |
| 11 |                  | 015-02701 GR35 | 1/SEC         | 10           | SECTION FRAME-FIXED TO-1"R (w/ snap valves)  | 10 |   |   |   |
| 12 |                  | 015-03480 GR17 | 1/SEC         | 10           | LOWER OPERATING AIR PIPING                   | 10 |   |   |   |
| 13 | #5               | 015-03123 GR10 | 1/SEC         | 10           | MOLO OPEN & CLOSE MECHANISM                  | 10 |   |   |   |
| 14 | #5               | 015-03123 GR11 | 1/SEC         | 0            | MOLO OPEN & CLOSE MECHANISM                  |    |   |   |   |
| 15 |                  | 015-02480 GR09 | 1/SEC         | 10           | SECTION FRAME LUBRICATION                    | 10 |   |   |   |
| 16 |                  | 015-01414 GR01 | 1/SEC         | 10           | INTERNAL C.C. INVERT PIPING                  | 10 |   |   |   |
| 17 |                  | 015-01346 GR05 | 1/SEC         | 10           | VALVE BLOCK EXHAUST PIPING                   | 10 |   |   |   |
| 18 |                  |                |               |              |                                              |    |   |   |   |
| 19 |                  | 015-02819 GR05 | 1/PMCH        | --           | GMC ENCLOSURE - CABLES FROM 03234 - CS 11    |    |   |   |   |
| 20 |                  | 015-03234 GR08 | 1/SEC         | --           | G08 WEIGHT CONTROL J-BOX & BRACKET           |    |   |   |   |
| 21 |                  | PCS-0206 GR14  | 1/PMCH        | --           | G08 WEIGHT CABLES                            |    |   |   |   |
| 22 |                  |                |               |              |                                              |    |   |   |   |

Vayres 11  
Modular Repair

Especificaciones  
Técnicas

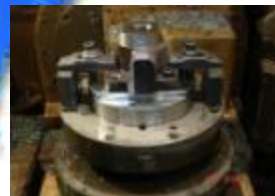
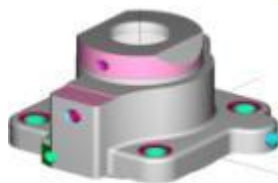
Requerimientos  
del Cliente



O-I Perrysburg

Plantas O-I Globales

O-I Cali



Planeación -  
Logística

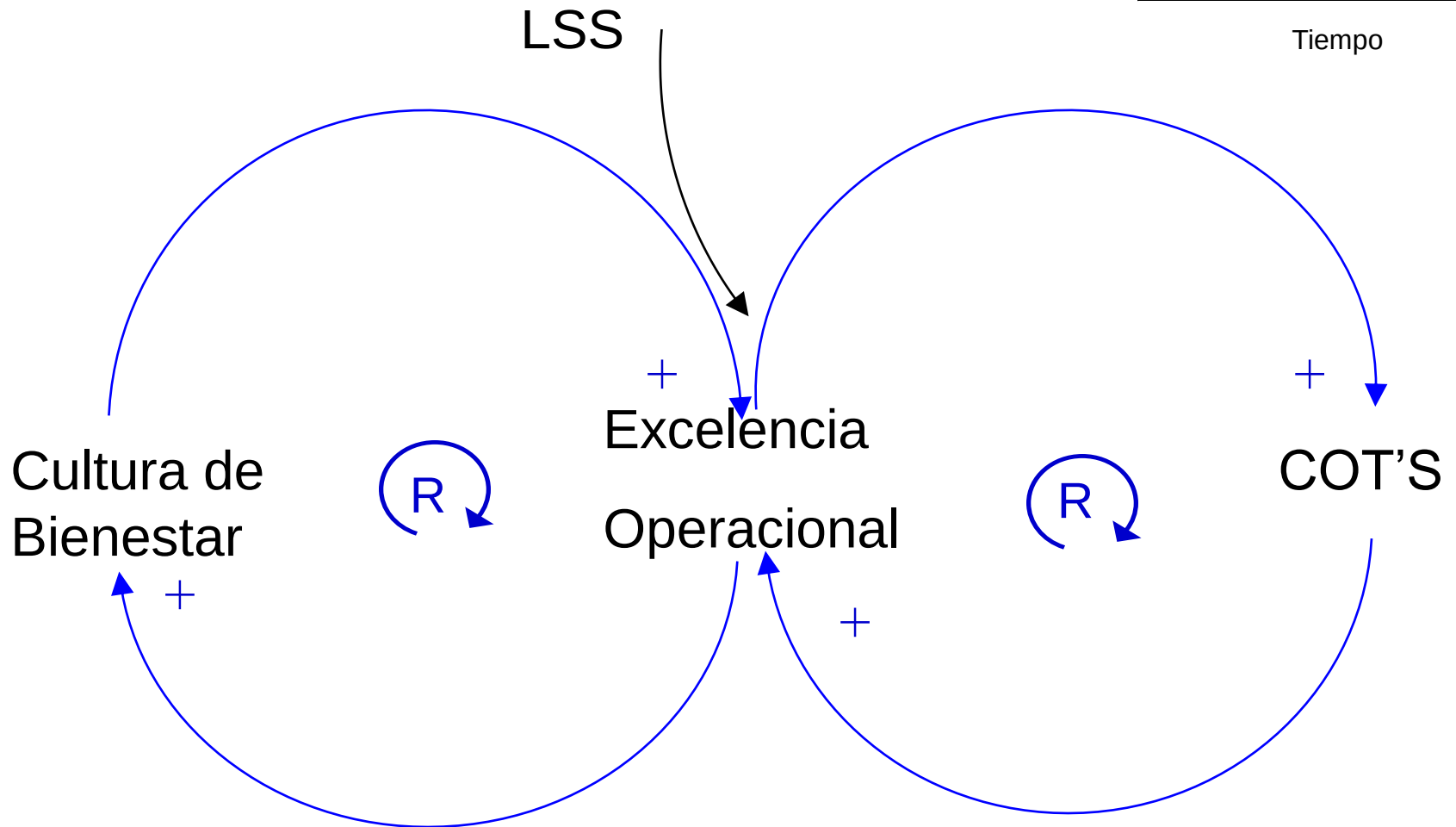
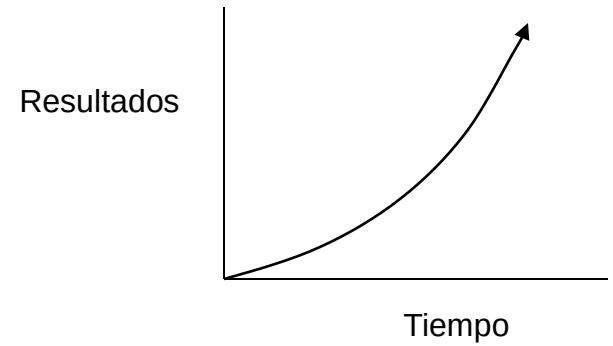
Ingeniería de  
Partes

Manufactura de  
Partes

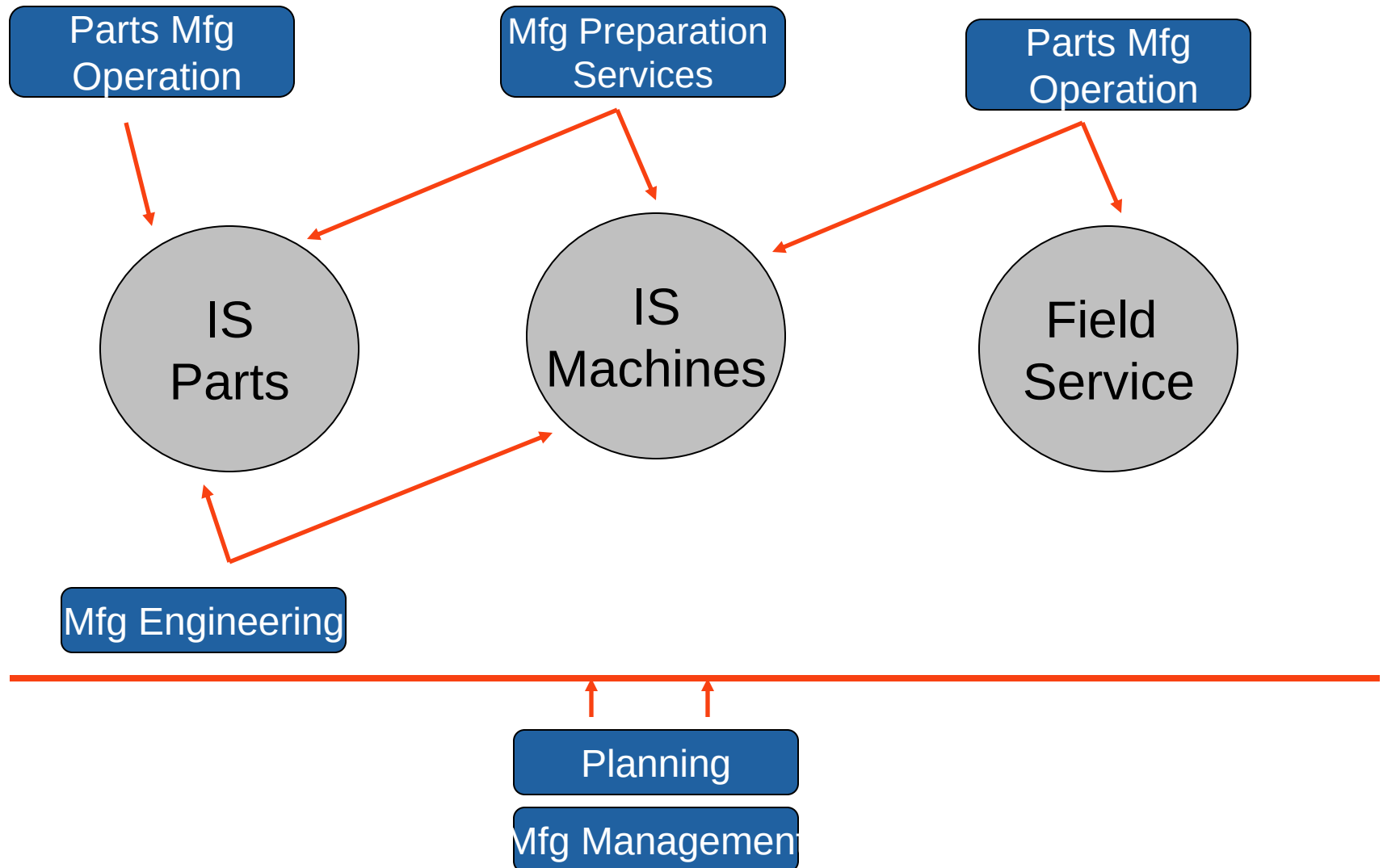
Manufactura de  
Mecanismos

Manufactura de  
Máquinas

# Estrategia



# Modelo de Negocio de Manufactura

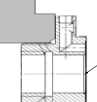
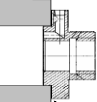


# Parts Engineering

Optimal material Selection



Manufacturing Processes  
Definition

| Cali                                                                                                                                                  |                         | JOB SETUP SHEET<br>Hoja de Montaje                                                                                                                                                 |                    |              |                                  |             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------|----------------------------------|-------------|
| MANUFACTURING<br>ENGINEERING                                                                                                                          | DRAWING #<br>Dibujo No. | OIS-18-404                                                                                                                                                                         | DONE BY<br>Elaboró | JOHN BUENARO | LAST REVISION<br>Fecha Ult. Rev. | 10-Nov-2005 |
| SEQUENCE #<br>Secuencia No.                                                                                                                           | 10                      | PROGRAM<br>Programa                                                                                                                                                                | OIS18404-PL-MIN    |              |                                  |             |
| <p>NOTA: LAS MORDAZAS SE DEBEN ALESAR Y HACERLES UN CHAPLAN DE 1/8" EN EL INICIO DEL DIÁMETRO PARA QUE PERMITAN UN BUEN ASENTAMIENTO DE LA PIEZA.</p> |                         | <p>MORDAZAS BLANDAS<br/>400 PSI</p>  <p>CERO DE PIEZA</p> <p>HACER TOPE CONTRA LAS MORDAZAS</p>   |                    |              |                                  |             |
|                                                                                                                                                       |                         | <p>MORDAZAS BLANDAS<br/>250 PSI</p>  <p>CERO DE PIEZA</p> <p>HACER TOPE CONTRA LAS MORDAZAS</p> |                    |              |                                  |             |
| SEQUENCE #<br>Secuencia No.                                                                                                                           | 20                      | PROGRAM<br>Programa                                                                                                                                                                | OIS18404-SL-MIN    |              |                                  |             |

Fixtures design

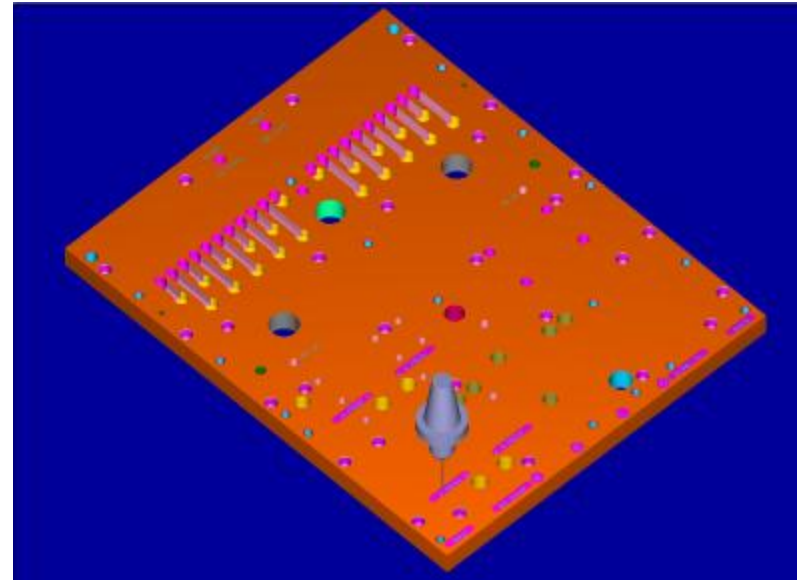


# Parts Engineering

Cutting Tools Selection



CNC Programming



# Parts Manufacturing



Readiness



CNC Machining



Quality Control



Paint-Complementary Processes



# Mechanisms Manufacturing



**Readiness**



**Manufacturing Cells**



**Final Product**



**Quality Control**



# MachinesManufacturing



Week 1



Week 2



Week 3



Week 4

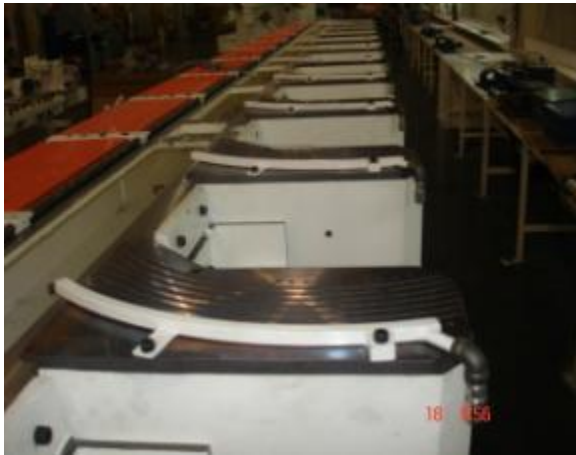


Week 5



Week 6

# MachinesManufacturing



**Week 7**



**Week 8**



**Week 9**



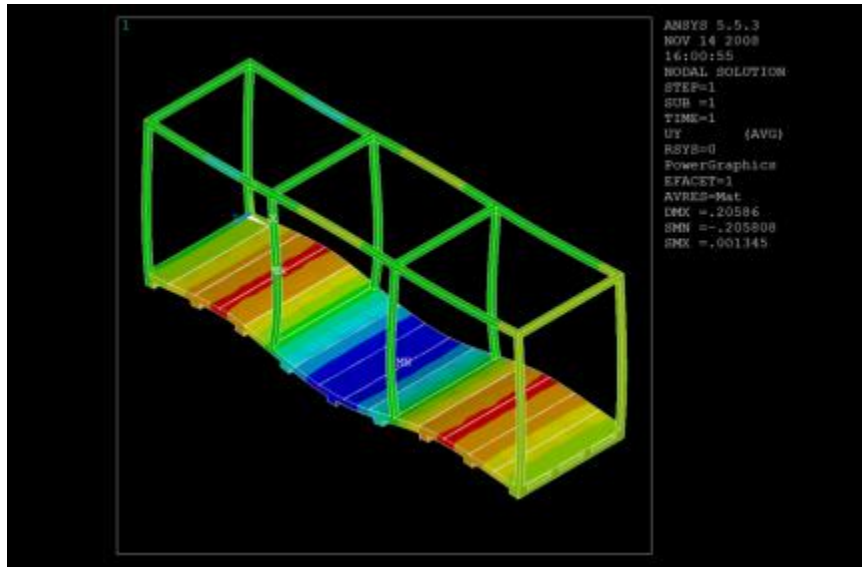
**Final Product  
Week 10-11**



# Tests – Quality Control



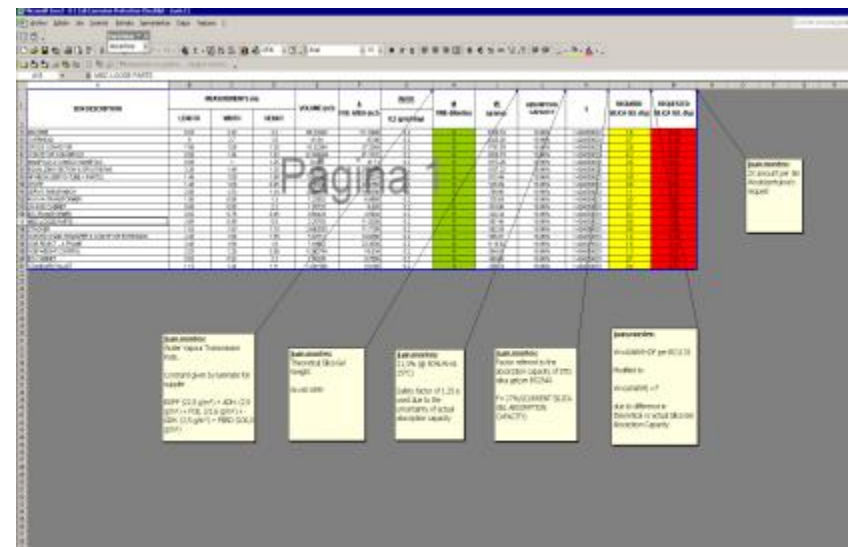
# Packaging Engineering



- Box design using FEA.
- Optimization of materials use.
- Cost Reduction

• Calculation and application of hygroscopic materials according to its destiny and voyage duration.

• Use of cutting edge technology in corrosion protection (VCI Emitters).





# Preparation - Packaging



Base



Overhead



Conveyor

# Containerization - Dispatch

