

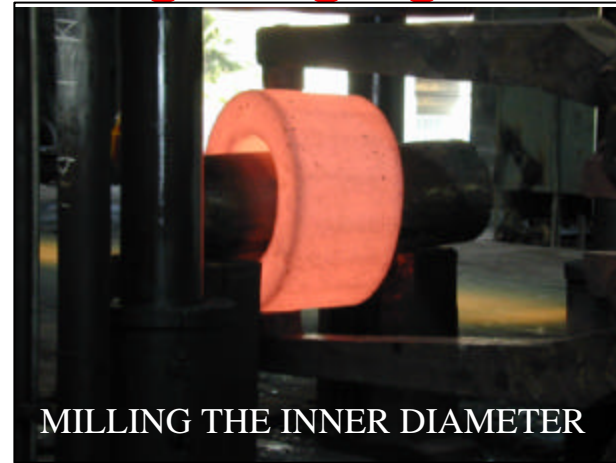
JUNCTION BOX STATUS

CERN, September 27th 2000

S. Cuneo

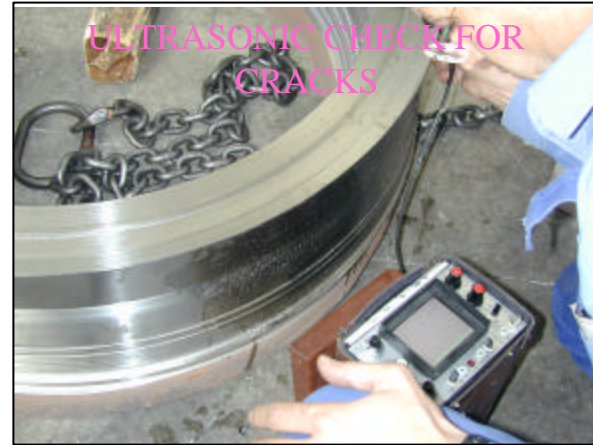
I.N.F.N. Genova

Vessel manufacturing: forging



ANTARES: Sept 27th 2000

Vessel manufacturing: shop tests



SHOP VERTICAL MILLING
MACHINE

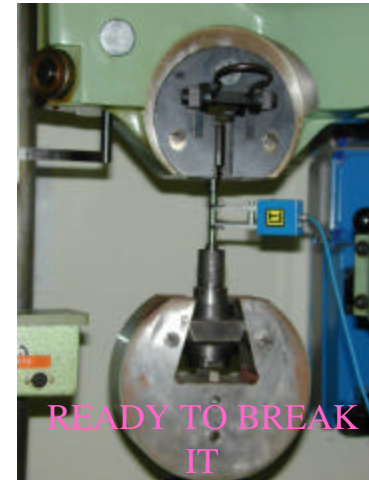
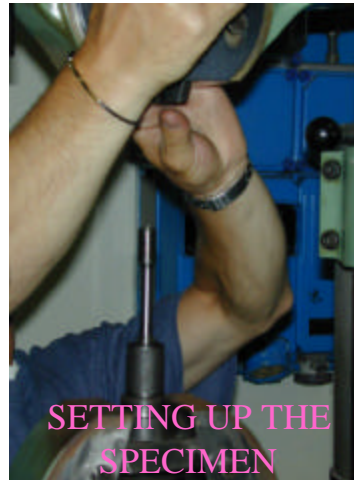


ANTARES: Sept 27th 2000



S. Cuneo (I.N.F.N. Genova)

Vessel manufacturing: lab tests



RESULTS:

- TENSILE STRENGTH: 943 MPa (SPEC. > 895)
- YIELD STRENGTH: 847 Mpa (SPEC. > 828)
- ELONGATION @ BREAK: 16% (SPEC. > 10)
- GRAIN SIZE: A LITTLE TOO LARGE, BUT IN THE STANDARD



Vessel manufacturing: status and next steps

SITUATION AT 26/09/00:

- MANUFACTURING: **COMPLETED**
- SUPPLY FINAL ACCEPTANCE CHECK: **NEXT WEEK** (MONDAY 01/10/00?)
- DELIVERY: **FIRST WEEK OF OCTOBER** (EXPECTED)

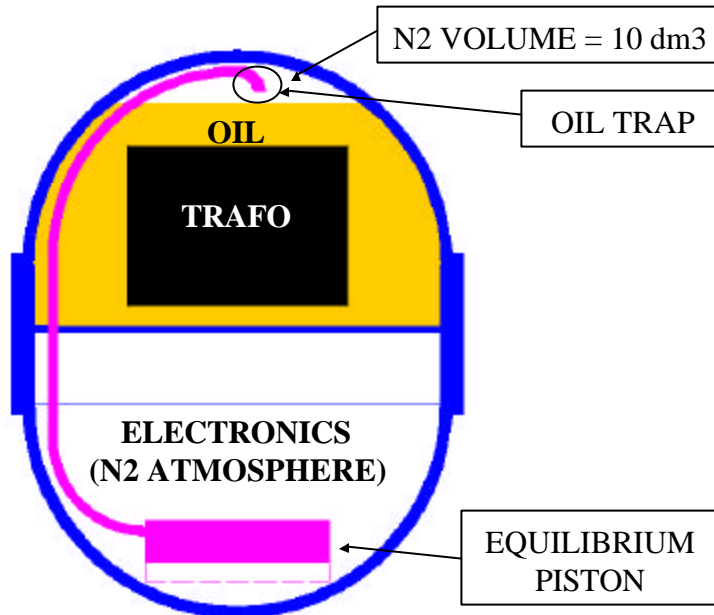
NEXT STEPS:

- ASSEMBLING FOR PRESSURE TESTS IN OUR LAB
- HYDRAULIC PRESSURE TESTS: IN THE **SECOND HALF OF OCTOBER**
- INTERNAL OIL TIGHTNESS: TEST CAMPAIGN FORESEEN IN OUR LAB
- DESIGN AND MANUFACTURING OF THE PRESSURE EQUILIBRIUM DEVICE
- DESIGN, MANUFACTURING AND TESTING OF THE INTERFACE CHAMBER WITH THE MAIN EOC
- ASSEMBLING OF THE COMPONENTS IN THE TRANSFORMER SIDE

Vessel pressure equilibrium device

- **SEA PRESSURE: REDUCES THE VOLUME OF THE OIL COMPARTMENT OF 1.1 dm³ (ESTIMATED)**
- **OIL TEMPERATURE: INCREASES FROM 20°C TO 50°C, THE OIL VOLUME INCREASES OF 3.9 dm³**
- **VOLUME AVAILABLE FOR N₂ ON THE TOP OF THE VESSEL: DECREASES FROM 10 dm³ TO 5 dm³**

PRESSURE IN THE OIL COMPARTMENT INCREASES TO 0.65 barg: **NOT ALLOWABLE**



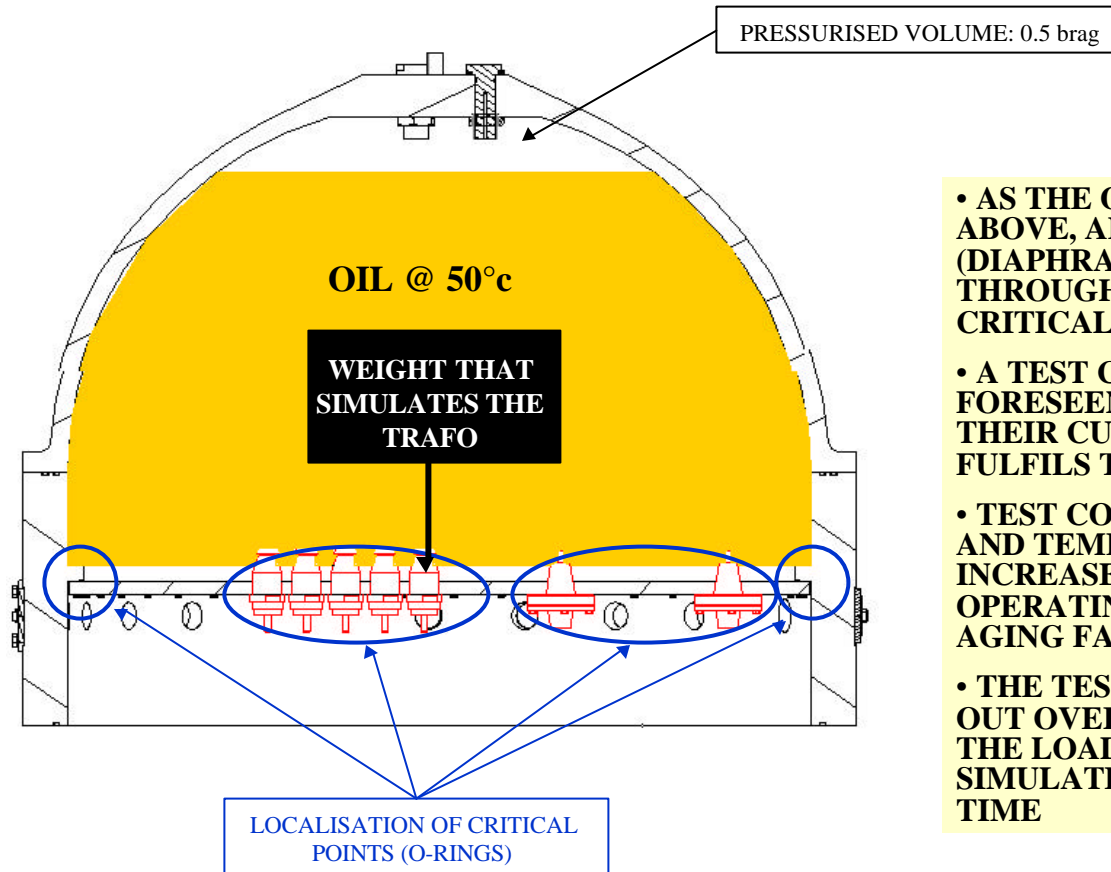
- **A PRESSURE EQUILIBRIUM DEVICE COULD BE A PISTON, CONNECTED THE GAS VOLUME ON THE TOP OF THE OIL COMPARTMENT, THAT CAN EXPAND ITS VOLUME UNDER A SLIGHT INCREASE OF PRESSURE, AND LET THE GAS RECOVER THE LOST VOLUME**

- **SUCH A PISTON SHOULD BE HOUSED IN THE ELECTRONICS COMPARTMENT**

- **THE CONNECTING PIPE SHOULD BE EQUIPPED WITH AN OIL TRAP, TO PREVENT THE OIL TO FLOW THROUGH IT**

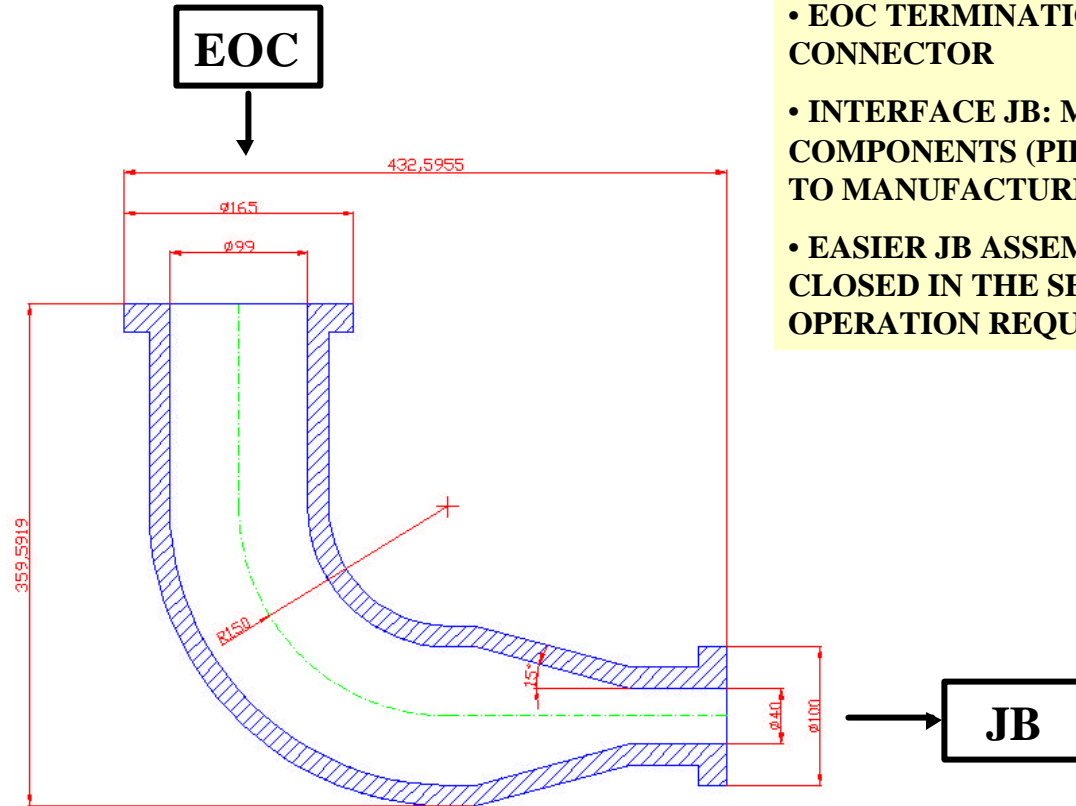
- **THE DEVICE OPERATION WILL BE TESTED FOR A SIGNIFICANT NUMBER OF CYCLES**

Vessel oil tightness tests



- AS THE OIL COMPARTMENT IS ABOVE, ALL INTERNAL SEALS (DIAPHRAGM AND FEED-THROUGH O-RINGS) BECOME CRITICAL
- A TEST CAMPAIGN IS FORESEEN TO CHECK WHETHER THEIR CURRENT DESIGN FULFILS THE REQUIREMENTS
- TEST CONDITIONS (PRESSURE AND TEMPERATURE) WILL BE INCREASED COMPARED TO THE OPERATING ONES, TO ACT AS AGING FACTORS
- THE TEST WILL BE CARRIED OUT OVER A WEEK, CYCLING THE LOAD, TRYING TO SIMULATE THE ACTION OF THE TIME

EOC interface JB: after last news



- **EOC TERMINATION: MALE/FEMALE DRY CONNECTOR**
- **INTERFACE JB: MADE OF STANDARD COMPONENTS (PIPES, FLANGES), EASIER TO MANUFACTURE AND TEST**
- **EASIER JB ASSEMBLY: THE JB CAN BE CLOSED IN THE SHOP, NO BOAT DECK OPERATION REQUIRED**