

Table of Contents

PIMS collaboration: 2nd technical meeting, 13 December 2010 at CERN.....	1
Participants:.....	1
Content.....	1
1. Construction and Planning.....	1
2. Construction Methods.....	2
2.1. Machining.....	2
2.2 Metrology.....	2
2.3 Brazing.....	2
2.4 Pressure Tests.....	2
2.5 Construction of additional pieces.....	2
4. Next Technical Meeting.....	3
5. Action list:.....	3

PIMS collaboration: 2nd technical meeting, 13 December 2010 at CERN

Participants:

Soltan Institute for Nuclear Studies (IPJ):

Grzegorz BRZEZINSKI (responsible for metrology), **Michal GRABOWSKI** (machining), **Marek MARCZENKO** (PIMS mechanical construction), **Michal MATUSIAK** (responsible for brazing, cleaning, leak tests), **Marcin WOJCIECHOWSKI** (IPJ Technical coordinator for PIMS collaboration, X-ray testing)

Computer Progress Litwiniuk (CPL):

Jan LITWINIUK (company owner)

CERN:

Alessandro DALLOCCHIO (PIMS mechanical design), **Gilles FAVRE** (PIMS mechanical construction at CERN), **Maurice FAVREL** (PIMS prototype machining), **Luca GENTINI** (PIMS drawings), **Frank GERIGK** (Linac4 accelerating structures, Technical coordinator for PIMS collaboration), **Mark JONES** (Large Scale Metrology), **Serge MATHOT** (Section leader of "Assembly and Forming"), **Dominique PUGNAT** (Metrology), **Benoit RIFFAUD** (PIMS support and wave-guide coupler), **Rolf WEGNER** (PIMS design and testing)

Content

List of talks, link to INDICO site [↗](#)

- 1. Construction and Planning
- 2. Construction Methods
- Next Meeting
- Action List

1. Construction and Planning

- M. Wojciechowski presented [↗](#) the foreseen construction planning for the 1st module. Since it is not yet completely clear how much time will be needed for each machining step, the planning for the complete series will only be made after having some construction experience.
- It was proposed that the machining of the rings will be subcontracted to CPL. All other works (including brazing) will be done at IPJ. CERN agreed to the proposal.
- Machining tests will start on the central ring (with wave-guide coupling), since this is the most difficult part. A central ring and normal ring will be sent to IPJ, to be machined as a pre-series at CPL.
- It has to be clarified how much copper can be stored safely at IPJ.
- For the transport of pieces IPJ considers to buy a van. A final decision will be taken before the end of the year.
- A first material delivery needs to arrive in Poland in the beginning of February.
- The present planning [↗](#) foresees the delivery of the first module to CERN at the end of April.
- 3 weeks are foreseen for the EBW works of each cavity. One week for the actual welding, and 2 weeks for transport.

2. Construction Methods

2.1. Machining

- CPL has an air-conditioned machining hall.
- IPJ plans to set up an air-conditioned box around the machines, which will be used for the PIMS. This should be in place at the beginning of February.
- Since the CERN workshop is not temperature controlled, a temperature compensation was done "manually" by measuring temperature, then the pieces, and compensating for temperature shifts on the machines,
- Question: on which areas was the +1mm oversize used for the rough machining steps on the rings?
Answer: it was used on the inside and on the contact areas to the discs, the outside was final machined before welding, the inside was machined after welding
- The test pieces, which are sent by CERN (rings and disc) shall be used for the first cavity (cavity C).
- The cutting speed used at CERN 90 was meter/min (reference to the tool shall be provided), -> CERN will give speeds and references to tools for all operations, (also for drilling of water cooling channels, threads for water connections)

2.2 Metrology

- the new metrology machine (DA coordinate meshing machine, Italy) has been set up at IPJ in an air conditioned room and offers a measurement volume of: 1 m x 1.5 m, 80 cm high,
- the measurement uncertainty on 600 mm is 5 um, which is comparable to the set-up at CERN,
- targets and target holders will be sent to IPJ together with the material for machining tests on rings,
- the target balls must only be handled with gloves, because of corrosion risk,
- the glue for fixation of target holders in the holes has to be ordered and sent to IPJ,
- the vertical axis (z) is given by the groove, which can be seen right and left of the tuner ports, and by the centre of the beam hole,
- the x axis is then given by a 90 deg angle from the centre of the beam hole,
- 2 measurements have to be made each piece, one for the references on the drawings, one with references to the laser tracker targets,
- if it becomes clear during production that all pieces are well within tolerances, CERN will decide on whether to reduce the amount of measurements for the verification of the references on the drawings,

2.3 Brazing

- M. Matusiak presented [information](#) about the new brazing oven at IPJ.
- Since the oven is not big enough to braze the central cell in vertical position as it was done at CERN.
As a consequence:
 - ◆ the technology has to be developed for horizontal brazing,
 - ◆ test pieces will be done,
 - ◆ now 1-2 grooves are needed to place the brazing wire, these grooves are not on the drawings, possibly 2,

2.4 Pressure Tests

- IPJ requests that the water pressure tests are replaced by gas pressure and He-sniffing test,

2.5 Construction of additional pieces

- CERN can increase the total value of the contract by up to 10% without having to redo all the paper work.
- IPJ will make a cost estimate for the additional pieces (pressure test and supports).

4. Next Technical Meeting

CERN will come to Poland, after the machining and controlling of the 1st disc and 1st ring, which is expected for the middle of February. By this time also some test brazings of the wave-guide port should have been done in the horizontal oven at IPJ.

5. Action list:

action	institute/person	status/result	completed
clarify how much copper can be stored safely at IPJ	IPJ	done 20 tons	12-20-2010
send central ring and standard ring to IPJ for machining tests at CPL	CERN, R. Wegner	done	2011-01-11
confirm if standard IPJ machining liquid can be used, or give reference for CERN brand	CERN, F. Gerigk	pending	
define exact date for next meeting in Poland (after machining of disc and ring, after brazing test), organise visit to CPL	IPJ	pending	
are there any specific requirements for the X-ray tests on the welded ports?	CERN, F. Gerigk	pending	
send metrology targets, target holders, and the glue for fixation of the target holders to IPJ	CERN, M. Jones, R. Wegner	targets, holders and gloves done , glue and pistol in discussion	2011-01-11
clarify how many pieces should be measured in the IPJ metrology lab	CERN, R. Wegner	done all pieces need to be measured, this can be re-considered if it is clear that all fabricated pieces are well within their tolerances	2010-12-17
send a test piece (3 GHz) for a metrology measurement comparison to CERN	IPJ	pending	
send a list with cutting speeds and used tools for all machining operations on the PIMS prototype, including water channels, and threading tools	CERN, G. Favre	done EDMS 1111284 ↗	17-12-2010
send material for 2 wave-guide flanges for brazing test	CERN, R. Wegner	done	2011-01-11
perform brazing test with wave-guide flanges in horizontal oven	IPJ	pending	
provide ISO specs for used brazing wires	CERN, S. Mathot	pending	
accept or decline that water pressure tests are replaced by gas pressure tests and He sniffing tests	CERN	pending	
send connectors and joints for water channel connections incl. hoses,	CERN, R. Wegner, J-M. Giguet	done	2011-01-11
added 1.2.2011: clarify cleaning procedure for copper parts,	CERN, R. Wegner	done EDMS 1122373 ↗	2011-02-07

-- FrankGerigk - 15-Dec-2010

This topic: SPL > PIMS13Dec10

Topic revision: r8 - 2011-02-07 - unknown



Copyright