Cryogenic Vessel

Status Report for TG04

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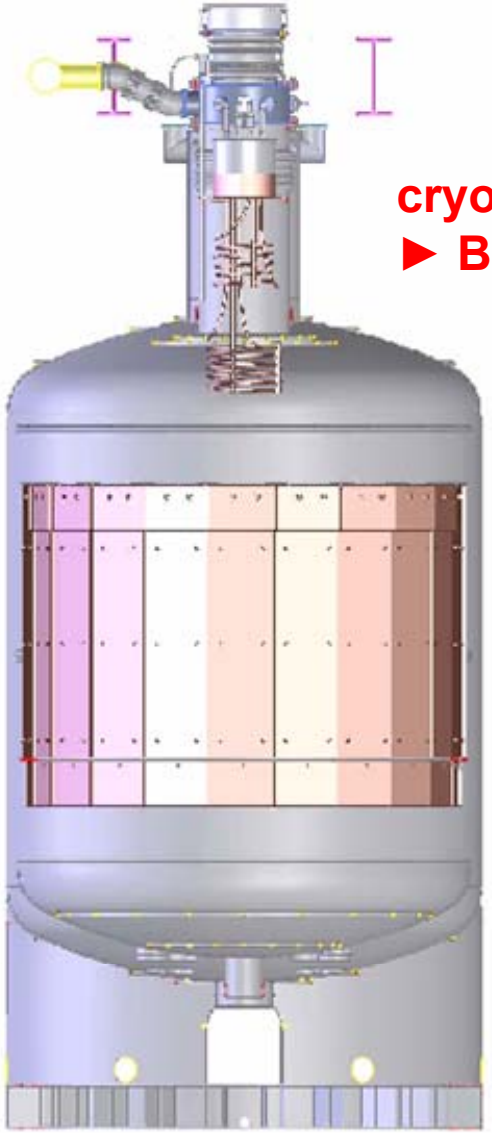
GERDA Collaboration Meeting at LNGS
9 - 11 June 2008

Outline

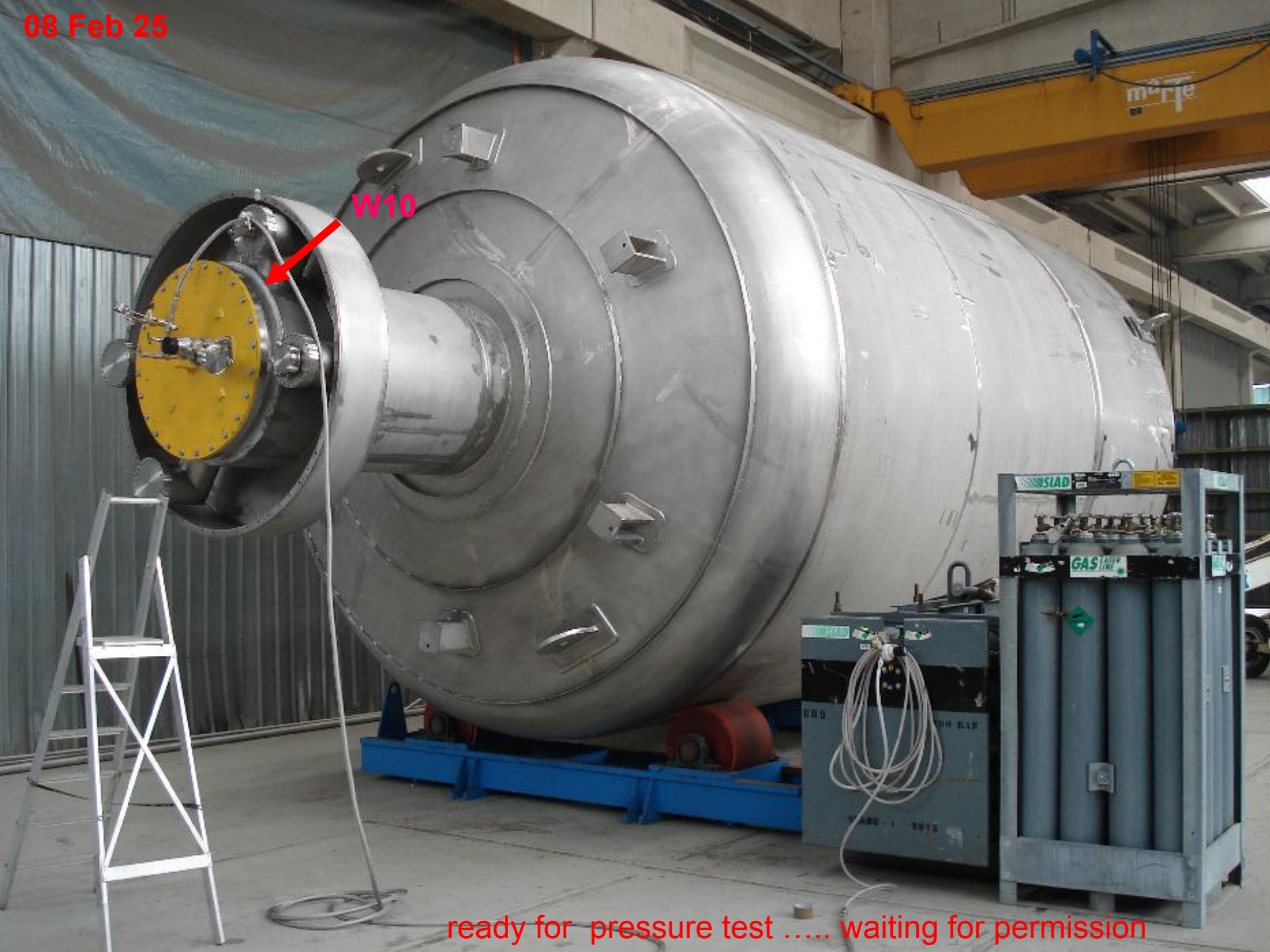


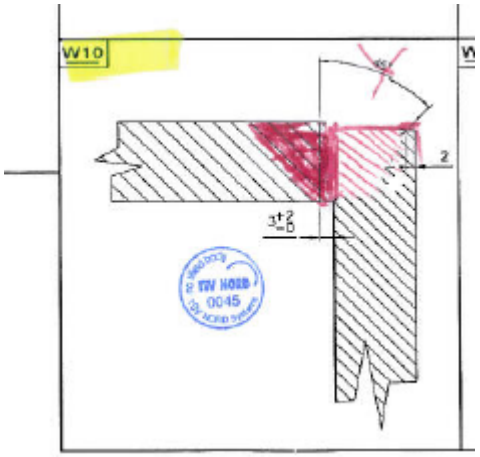
cryogenic infrastructure
► Bernhard

- **progress**
- **photos**
- **problem(s?)**

Progress

	new cleaning cycle	
25 Feb :	cryostat filled with Rn-free nitrogen (for Rn test)	
27 Feb :	pressure test of outer vessel	1.85 barg N2
03 Mar :	cryostat leaving SIMIC	
06 Mar :	arrival & installation in Hall A of LNGS	
11 Mar :	Rn-222 emanation test, 2 extractions (44/40m3)	13.6±2/13.7±2 mBq
18 Mar :	internal copper shield installed	
04 Apr :	LN2 evaporation test of completely filled cryostat	<4Nm3/h (<300W)
09 Apr :	21:35 cryostat again empty	(3.6/3.2/2.9 @3/6/9 pm)
28 Apr :	start of WT construction	
03 May:	Rn-222 emanation test, 2 extractions (26/20m3)	121±5/120±5 mBq


08 Feb 25
W10
SIAD
GAS
ready for pressure test ….. waiting for permission



TÜV NORD

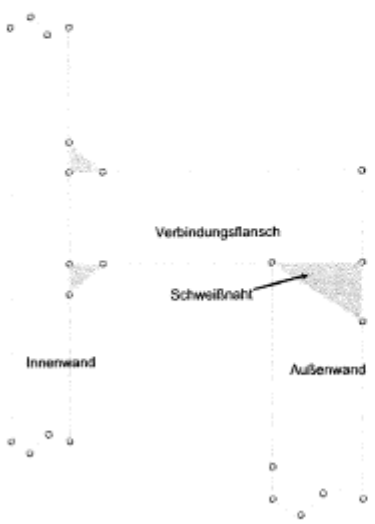


Abb. 1: Vorgesehene Ausführung

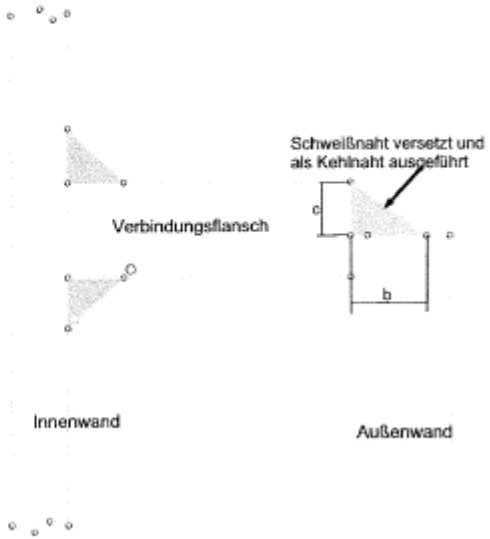
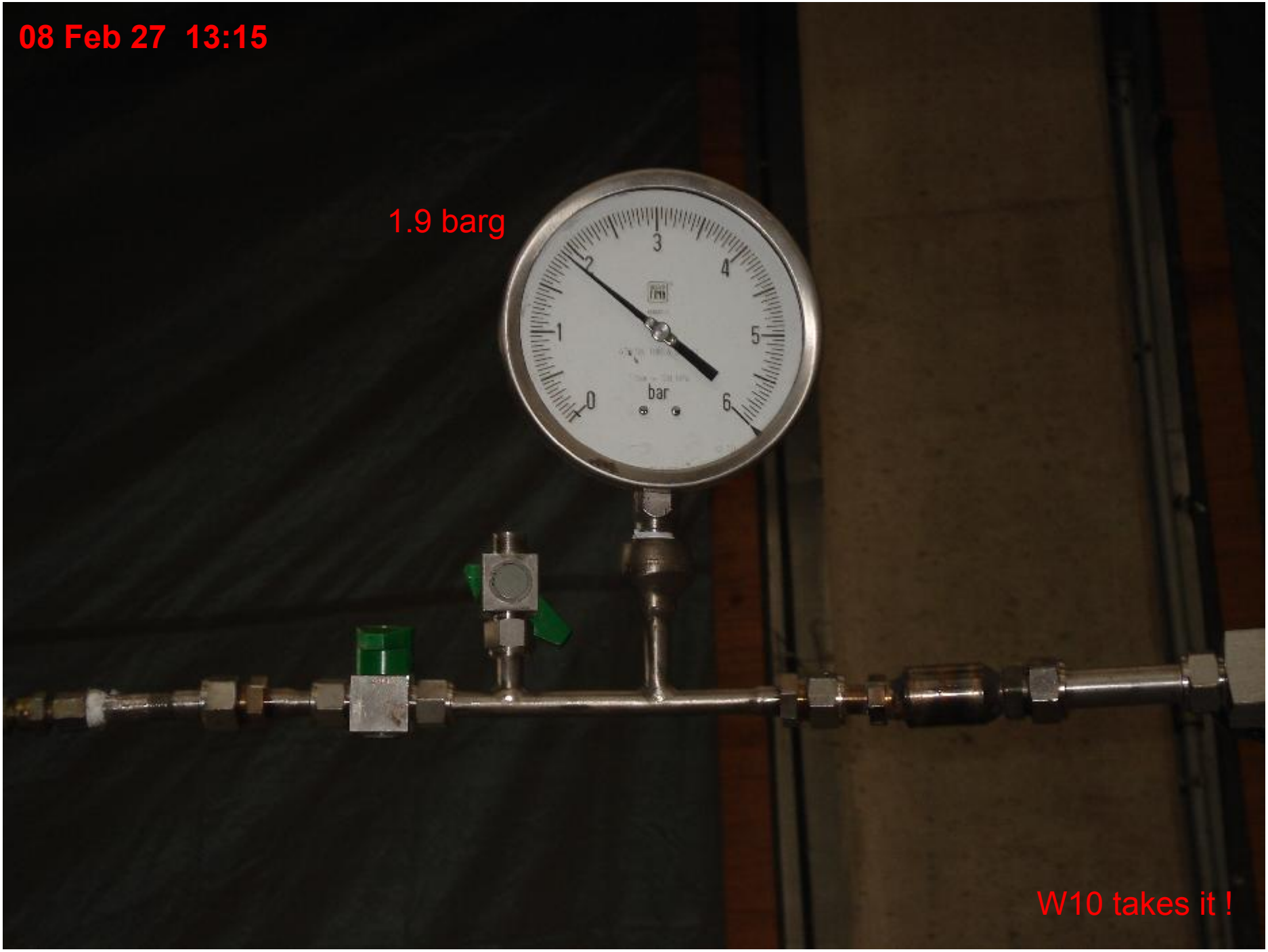


Abb. 2: vorhandene Ausführung

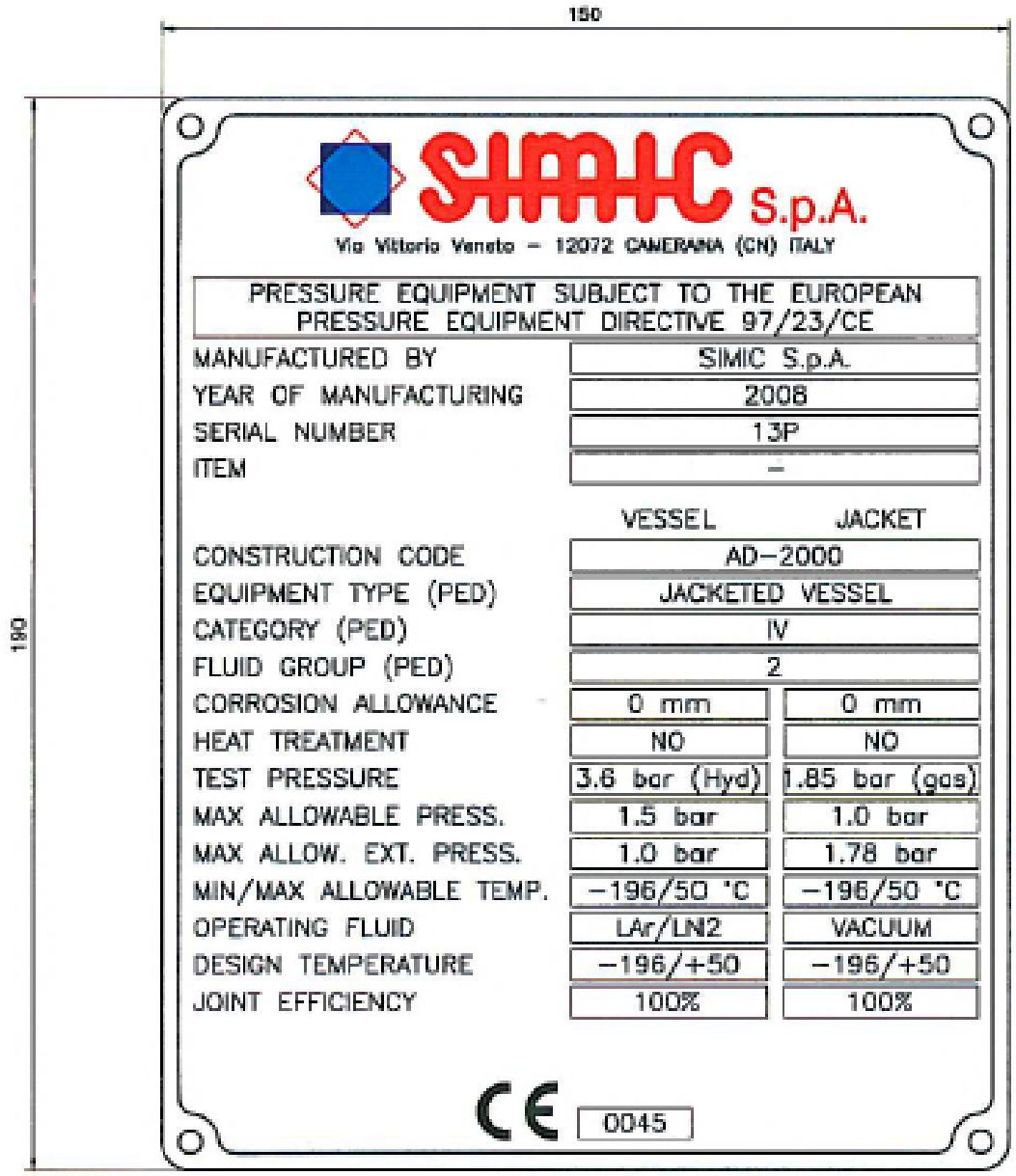
Zusammenfassend stellen wir fest, dass die durch die Linearisierung der Spannungskomponenten der Membran- plus Biegespannung ermittelte maximale Vergleichsspannung von $P_m + P_b = 144$ N/mm^2 der Schweißnaht unterhalb der zulässigen Spannung von $\sigma_{zul} = 156$ N/mm^2 liegt, d.h. der Innendruck wird, unter den angenommen Maßen der hier vorliegenden Schweißnahtausführung, sicher abgetragen.

es wird / ist alles gut …..


SIAD
SIAD
GAS LASER LINE
GAS LASER LINE
08 Feb 27 14:19


08 Feb 27 13:15
1.9 barg
bar
W10 takes it !

name plate



submitted for approval to TÜV

08 Mar 03 at SIMIC


08 Mar 08 08:55


MAN
DATACOL
boxes with copper shield
08 Mar 06 17:20


ATORI
ASSO
25
MAN
DATACOL
08 Mar 06 17:26


SIMIC team leader G.Costa
08 Mar 06 19:29

SIMIC team rdy for Cu shield installation


installation done after 2:30 hrs
08 Mar 06 19:52

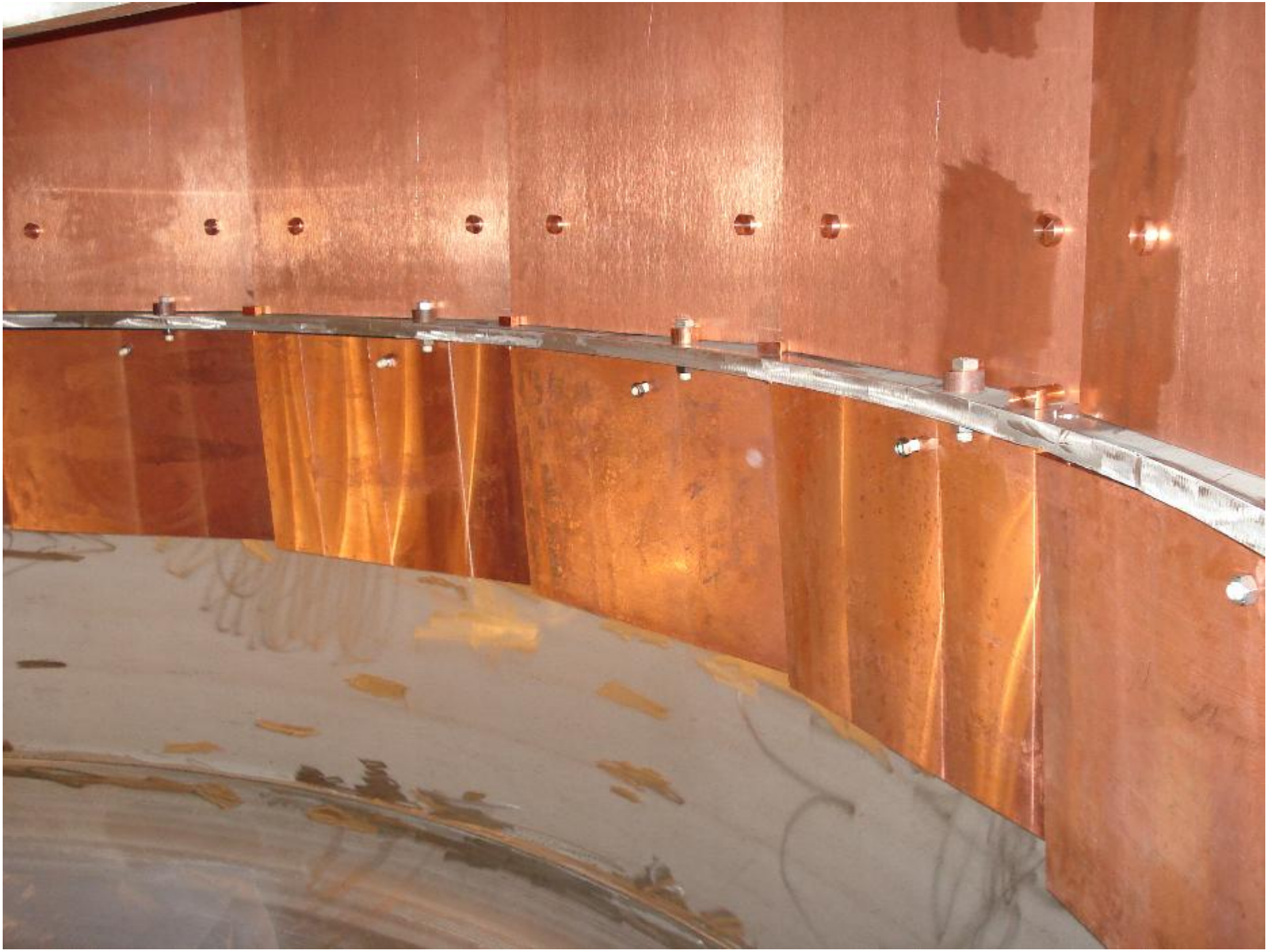

Rn emanation test followed by
installation of Cu shield
08 Mar 09


08 Mar 07 17:21

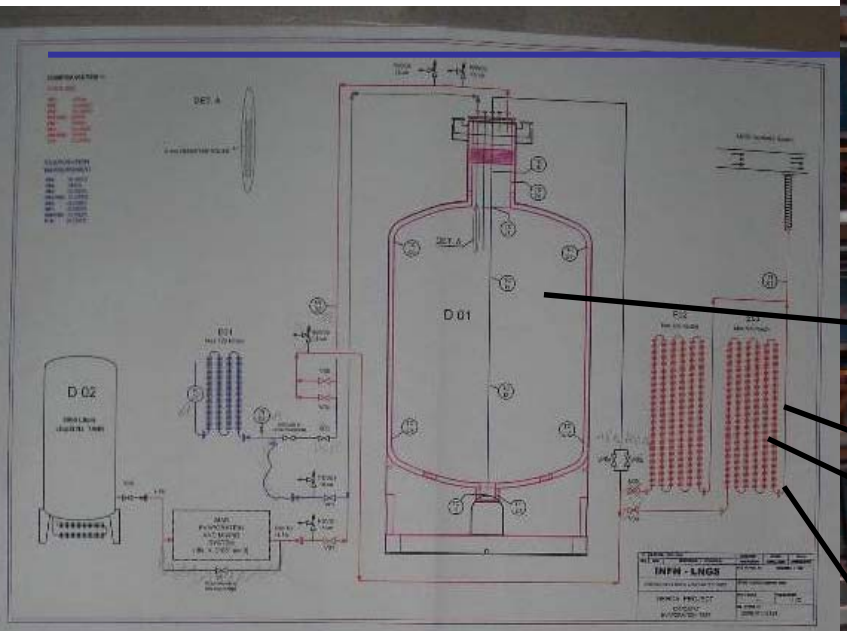

Gzegorz and Luigi
on the way up for
the Rn test

Who ordered that?

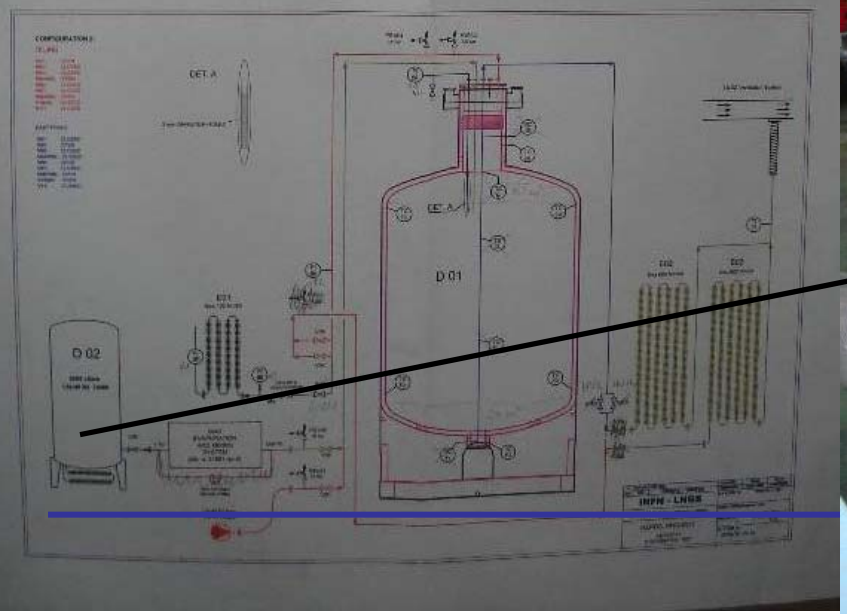
set up for copper shield installation




Evaporation test at LNGS followed by
another Rn emanation test
08 Mar 18



setup for evaporation test

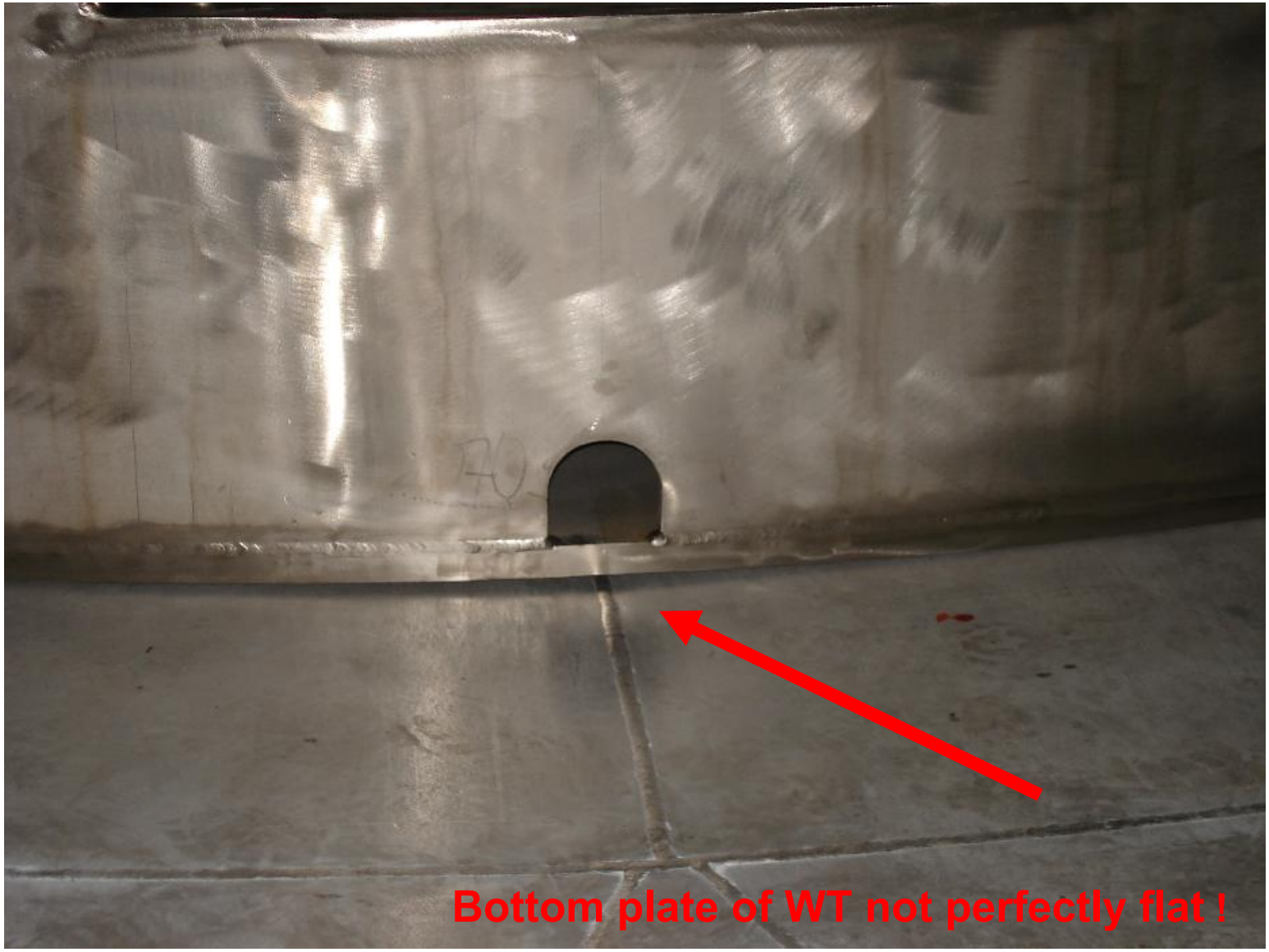


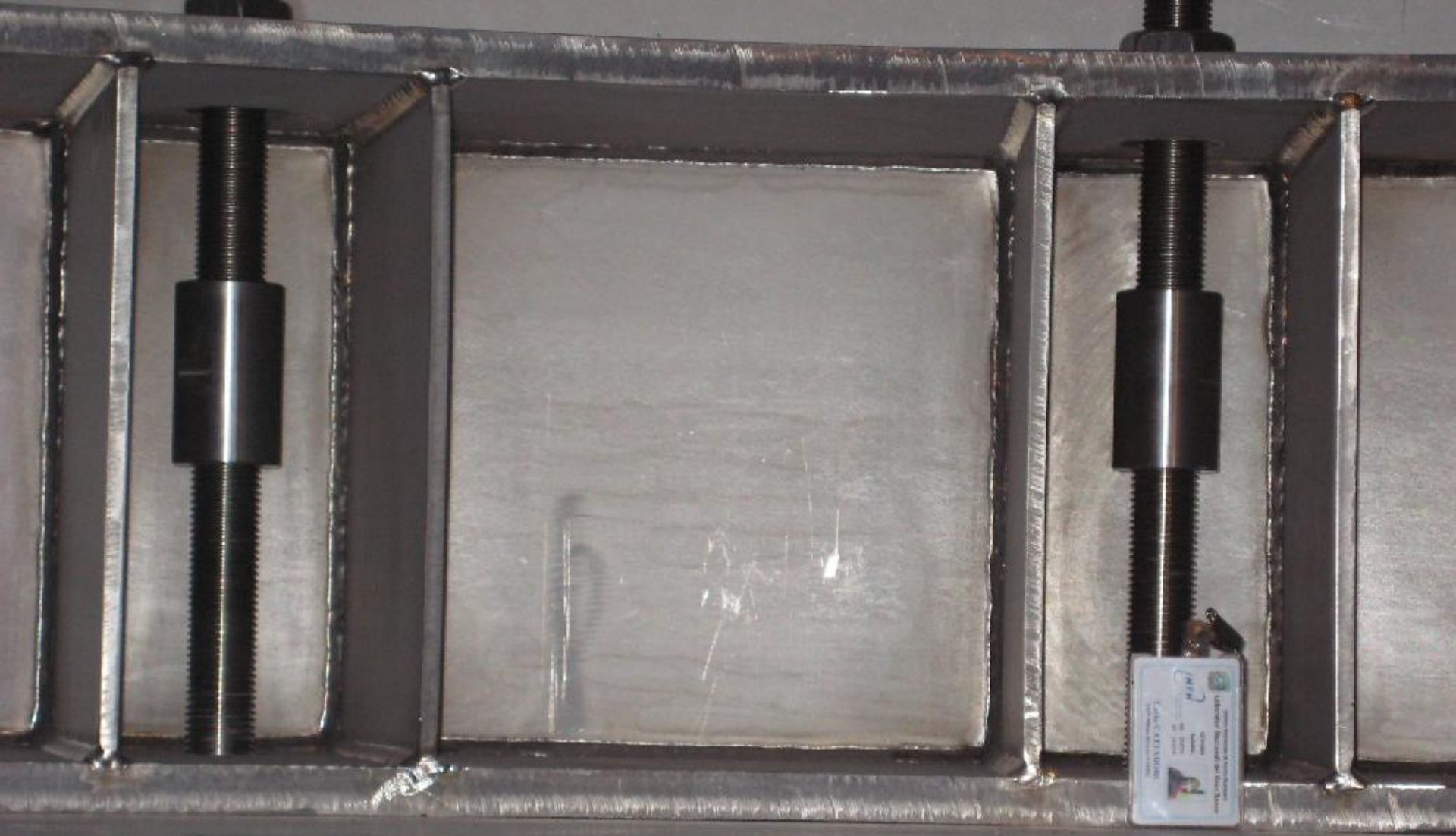
BIG thanx to LNGS team

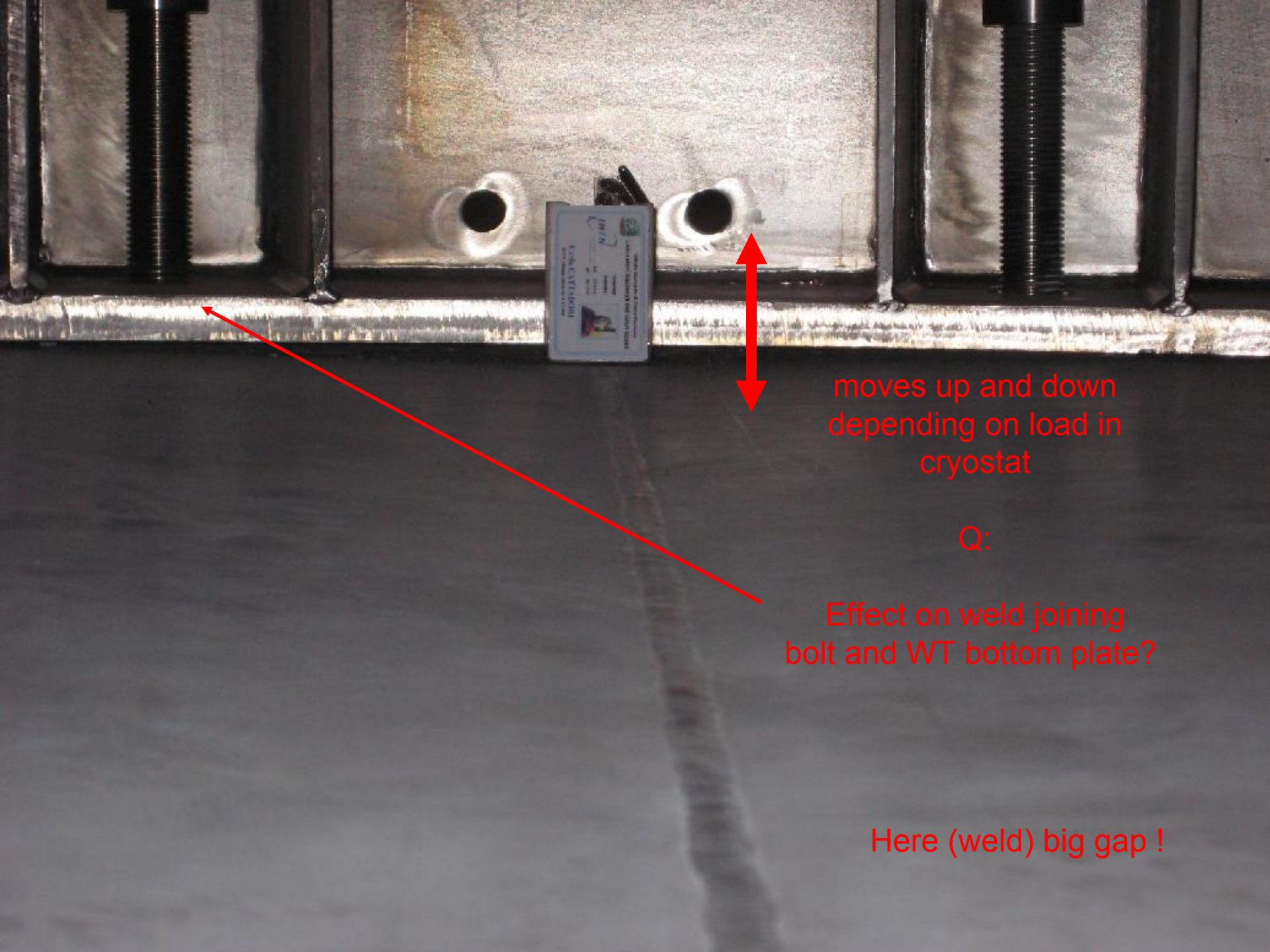

Hardy preparing 3rd
Rn emanation test
on top of cryostat


Problem(s?)

Possible problem




Here (no welds) OK !


moves up and down
depending on load in
cryostat
Q:
Effect on weld joining
bolt and WT bottom plate?
Here (weld) big gap !

Careful inspections of welds did not reveal cracks!

Needs confirmation.
Test with 1m water column ongoing.
► **See WT talk!**

14 ► 120 mBq

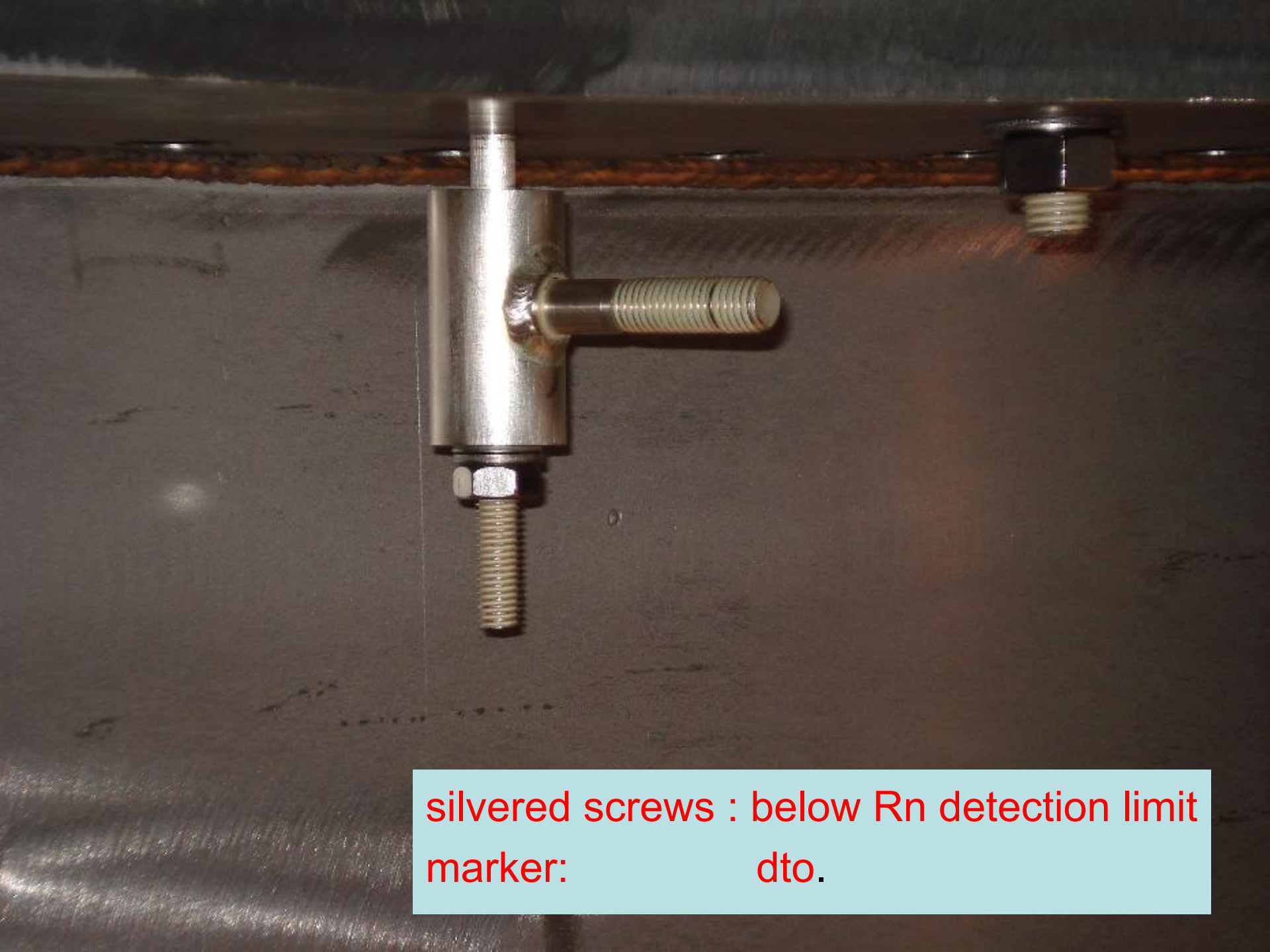
8 **mBq ► bgnd index of 10^-4**

possible sources

marker writing

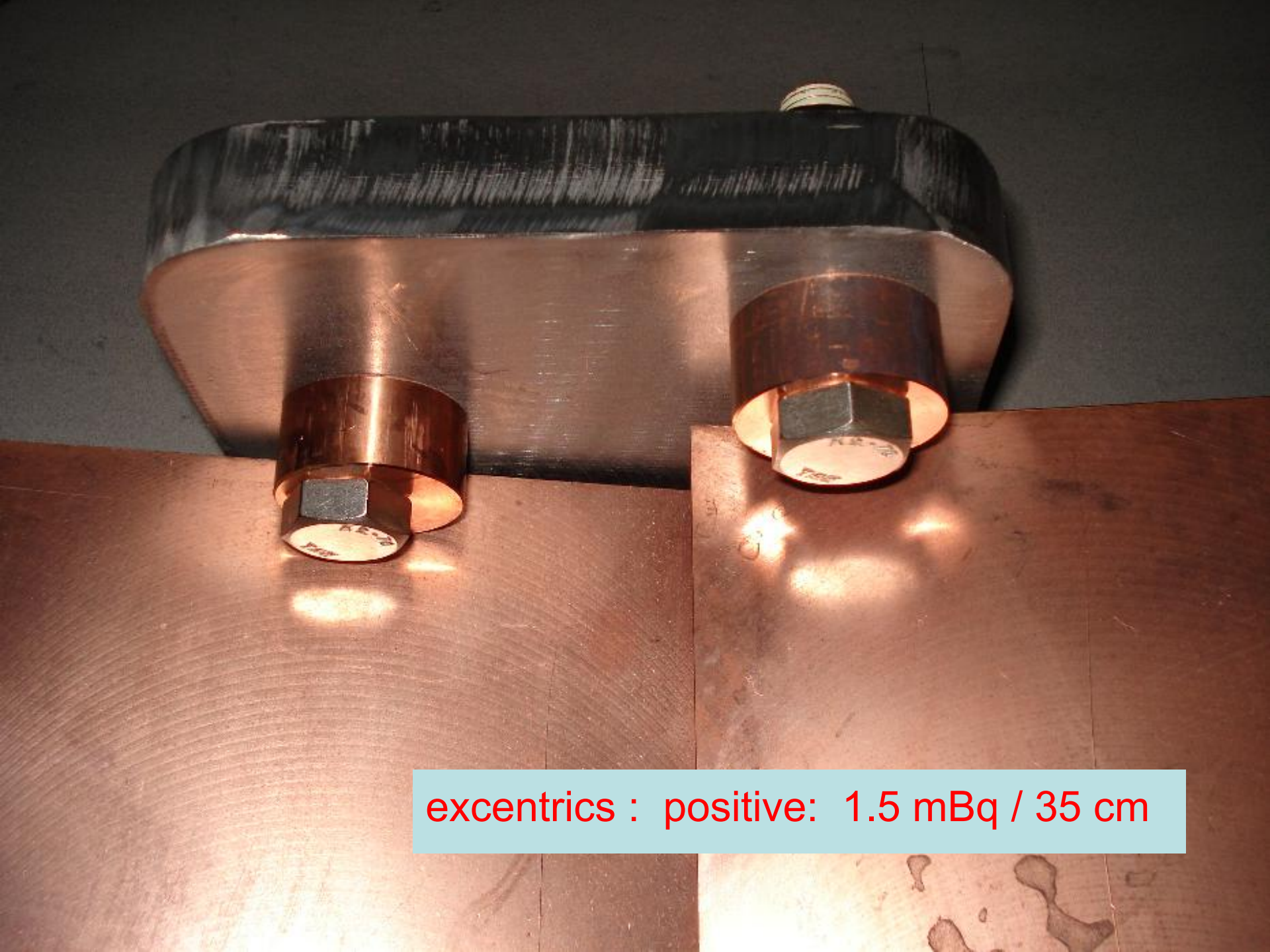
silvered screws

Cu excentric
w black oxid



silvered screws : below Rn detection limit

marker: dto.


excentrics : positive: 1.5 mBq / 35 cm

Results of screening campaign at HD

see TG11 talks !

marker :	no detectable contribution
silvered screws :	dto.
sulfuric acid from CSN:	dto
oxidized Cu excentrics:	120 cm ► 5.1 mBq – not dominant!
DUST?!	typ. 30 mBq/g
AIR???	~50 Bq/m3

IF results CONFIRMED:

See integration session tomorrow!

Conclusions

much progress

cryostat delivered

all tech. specs met

… but still some clouds

Rn level too high

The End