



# Discussion on Cavity Assembly Work at KEK

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**(KEK, Japan)**



# Visiting FNAL and DESY

2009, Sept. 10-11 ; FNAL (S. Noguchi & E. Kako)

2009, Sept. 18 ; DESY (N. Ohuchi & E. Kako)

**The purpose was to have a discussion  
on cavity assembly and alignment  
for the S1-G cryomodule**

**We found out many things to have to do ....**



# Items to be solved

1. Transport Fixture for Shipping to KEK
2. Cavity Assembling Tools
3. Cavity Alignment Tools
4. Cleaning of Gate-Valves
5. Ionization Gas blower & Particle Counter
6. Cavity Assembly Work in Clean Room
7. Assembly Work of Tuner,(Saclay & Blade)
8. Assembly Work of Magnetic Shields
9. Installation of 4 Warm Couplers, (TTF-III)
10. Conditioning of 4 TTF-III Couplers
11. Meeting for Assembly Work at KEK

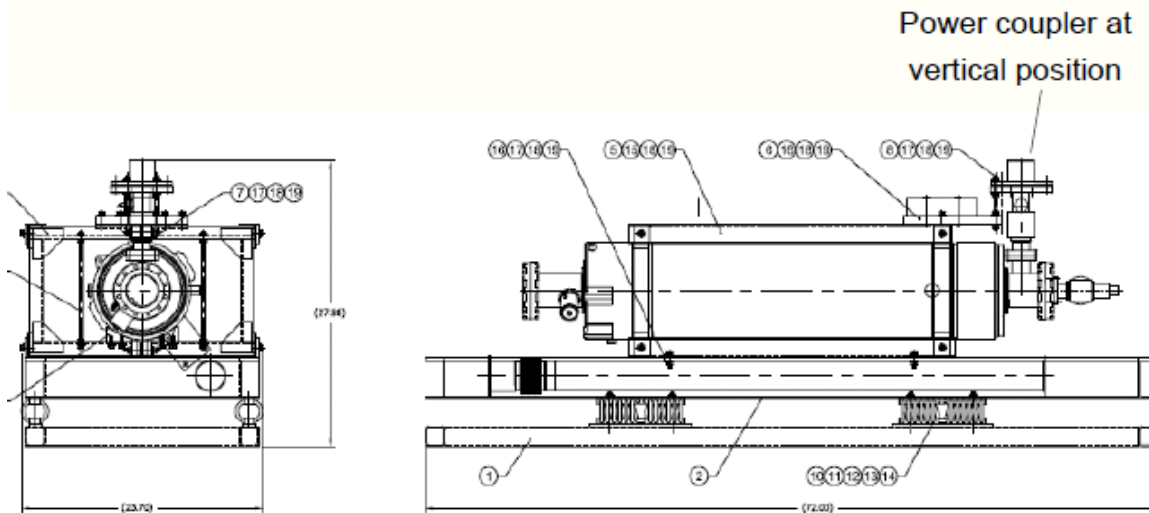


# 1. Transport Fixture for Shipping

## 1- Receive Dressed Cavities



The dressed cavity transport fixture is used to transport dressed cavities with main coupler (cold end) installed



Talk by Tug Arkan  
@ TILC09

## Dressed Cavity Transport Fixture

→ only 2 sets at FNAL, drawings by FNAL

→ How transport DESY cavities ???



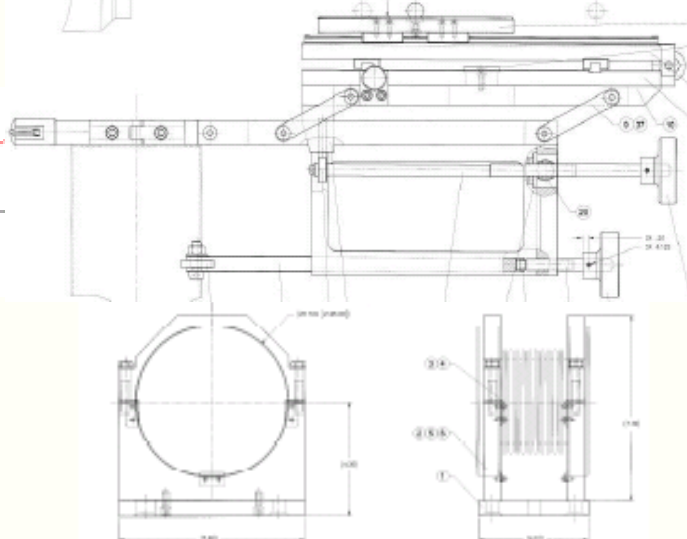
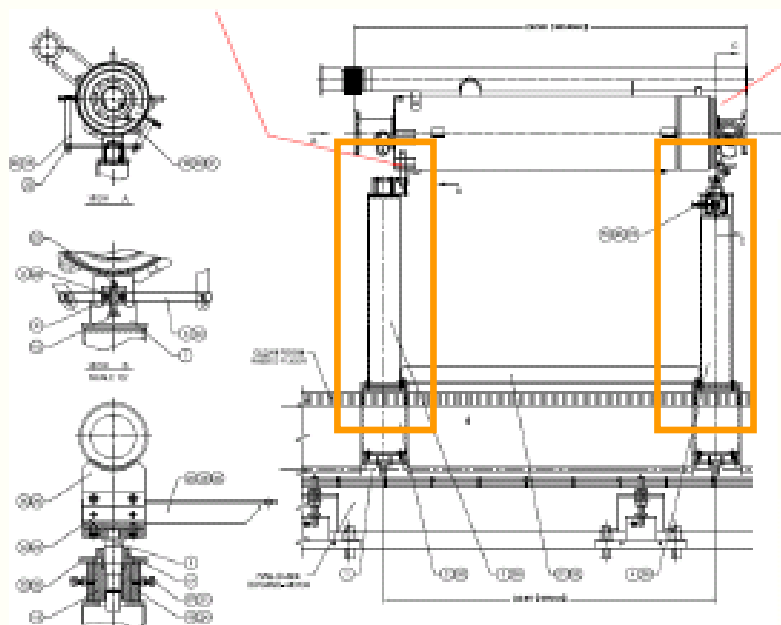
# 2. Cavity Assembly Tools

## Cavity Support Posts Fixture



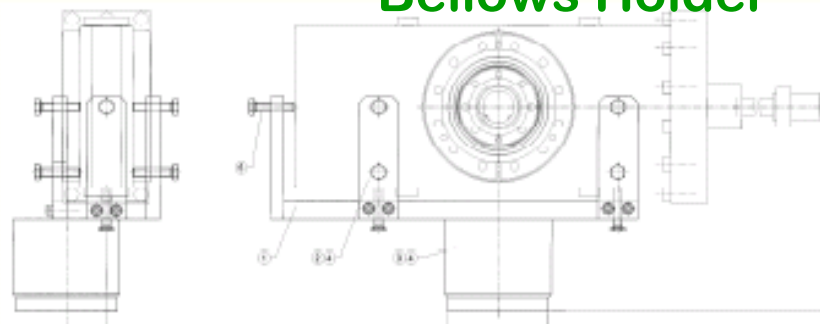
Adjustable Table

Cavity is supported with two clamps around the helium vessel at the field probe end



Interconnecting Bellows Holder Fixture

Bellows Holder



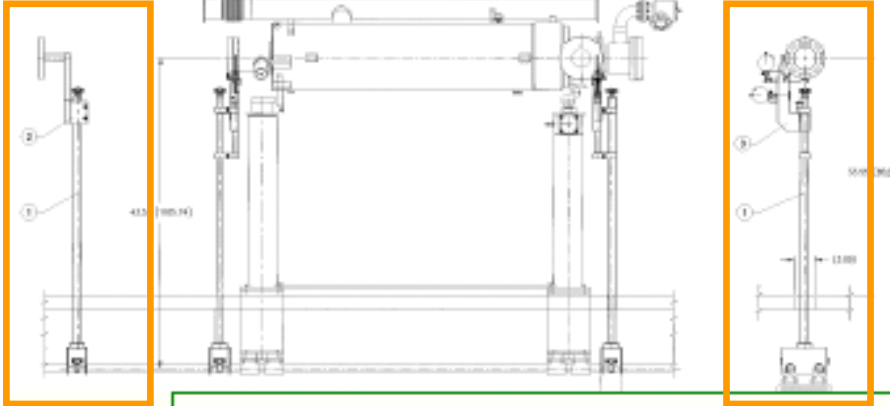
Gate Valve Holder & Alignment Fixture

Gate Valve Holder

Is there any possibility to borrow these tools from FNAL ???

# 3. Cavity Alignment Tools

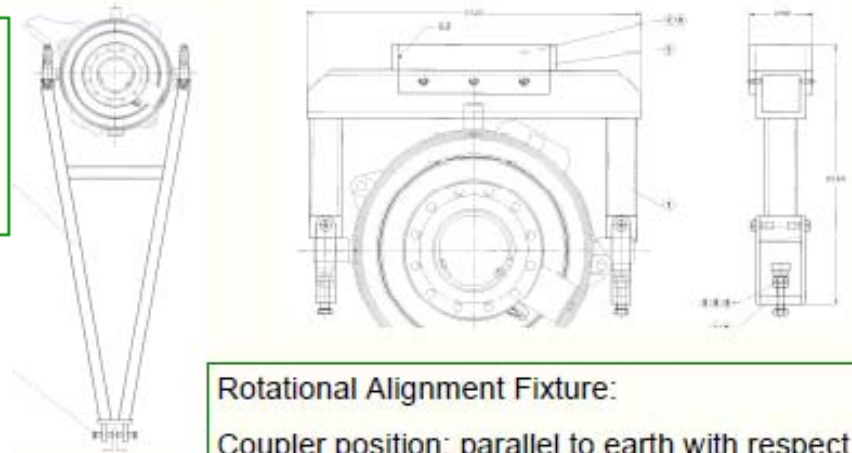
## 4 – Cavity Alignment in the clean room



**X-Y Alignment Fixture:**  
Cavities beam line flanges are aligned to ~0.1mm for the interconnect bellows assembly in the clean room

Jigs for interfaces are designed and fabricated at KEK.

Is there any possibility to borrow these tools from FNAL ???

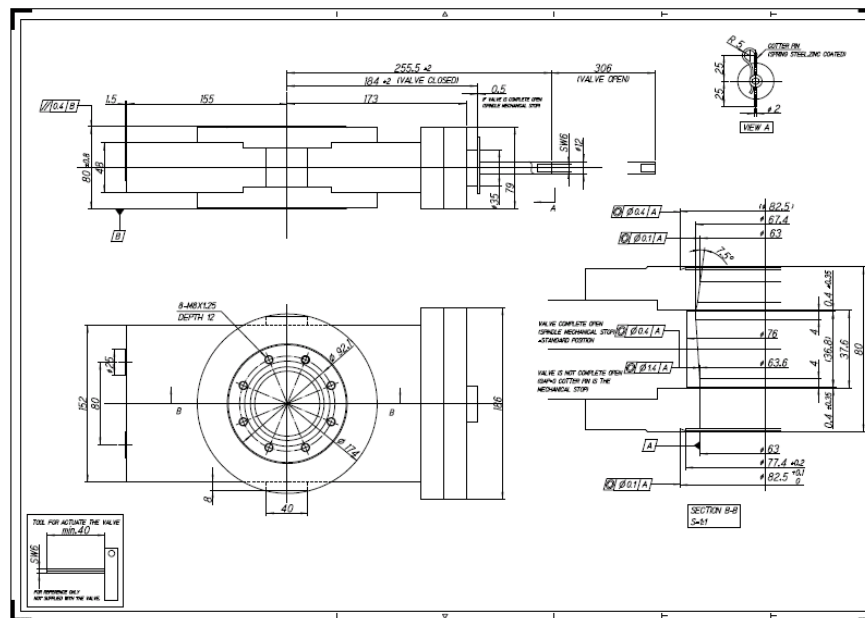


**Rotational Alignment Fixture:**  
Coupler position: parallel to earth with respect to the cavity helium vessel lugs



# 4. Cleaning of Gate Valves

Removing dust particles inside a gate valve is an essential work to maintain high field performance of the cavities.



Excellent techniques by experts are required for this work.

If possible,  
KEK would like to ask Lutz, leader of DESY vacuum group ???



5. Ionization gas blower ; (from DESY ??)  
Particle Counter ; (KEK, need improvement)

6. Cavity assembly work in clean room  
(middle of January, 2010)

Necessity of Working Team by DESY, FNAL, KEK

Cavity assembly work  
by only 2 persons  
in class 10 clean room

DESY : A. Matheisen, 1 Technician ??

FNAL : T. Arkan, 1 Technician ??

KEK : S. Noguchi, E. Kako, Support Staffs





## 7. Assembly work of Tuner

(middle of February, 2010)

Tuner assembly technique is strongly related to the tuner performance and operation.

Saclay tuner should be assembled by DESY. ??

Blade tuner should be assembled by FNAL. ??

## 8. Assembly work of Magnetic shields

Assembly of tuner and magnetic shields will be carried out in the same period.

DESY and FNAL will join this assembly. ??

## 9. Installation of 4 warm couplers

(middle of March, 2010)

## 10. Conditioning of 4 TTF-III couplers before cool-down

(end of August, 2010)

2 DESY experts (W.-D. Moeller and D. Kostin)  
will undertake this coupler work. ??

# 11. Meeting for assembly work at KEK

We do not have enough time  
for preparing cavity assembly work.  
We need more discussion  
to confirm the procedure.

**We propose the meeting at KEK:**  
participation of Axel, Wolf-Dietrich, ....., (DESY)  
Jim, Tug, ....., (FNAL)  
at least 2 days,  
see & check STF clean room, then discussion  
end of Oct. or beginning of Nov.