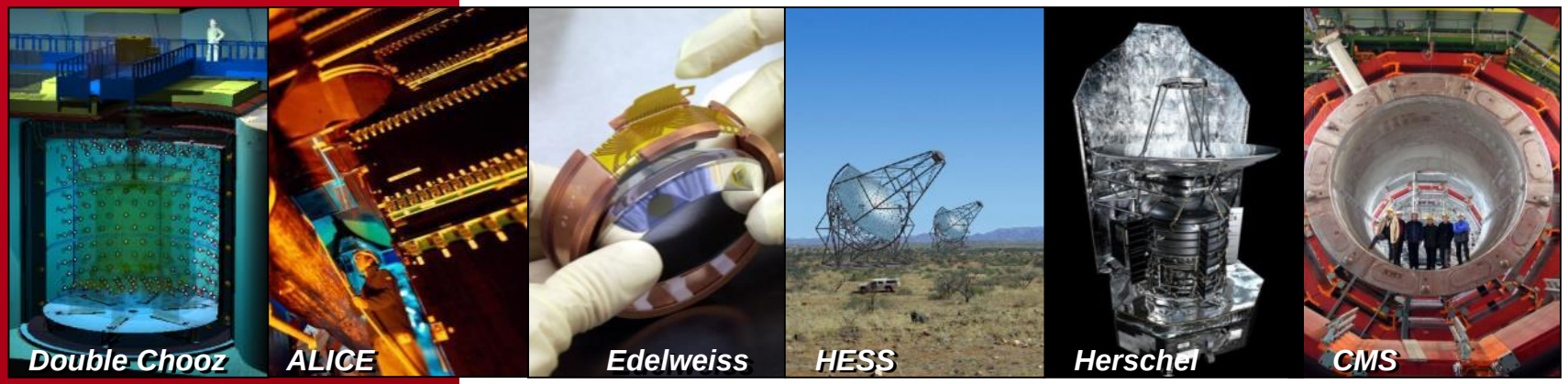
DE LA RECHERCHE À L'INDUSTRIE

CEA PREVENTIVE ACTIONS FOR XFEL CRYOMODULE ASSEMBLY



Detecting radiations from the Universe.

Stéphane BERRY completed from Trublet| Thierry at XFEL meeting in 2015 April

COUPLER WARM PART ASSEMBLY

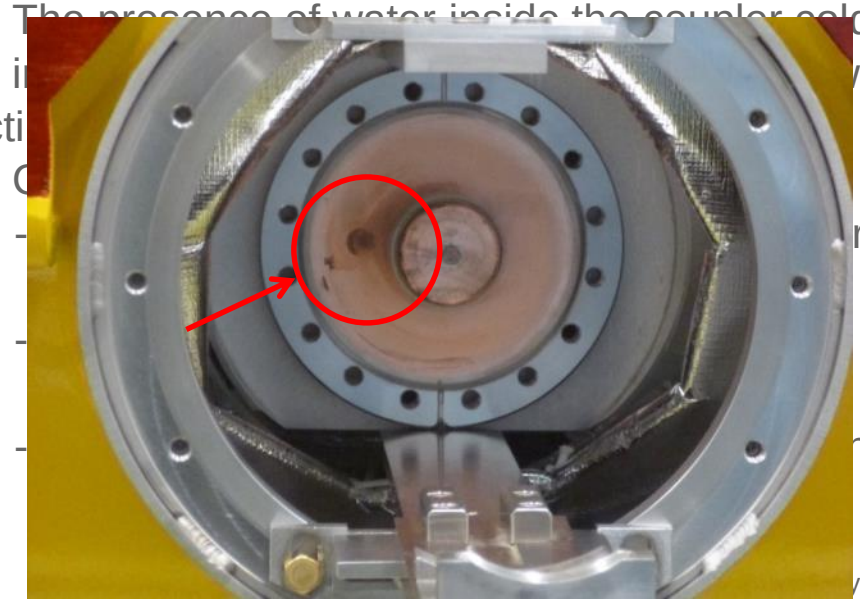
www.cea.fr

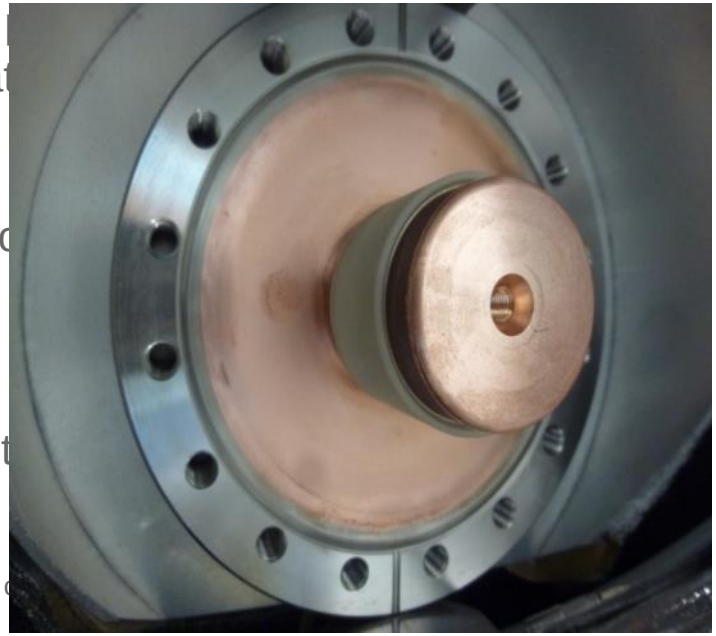
Irfu

NON CONFORMTIES

Coupler Cold Part

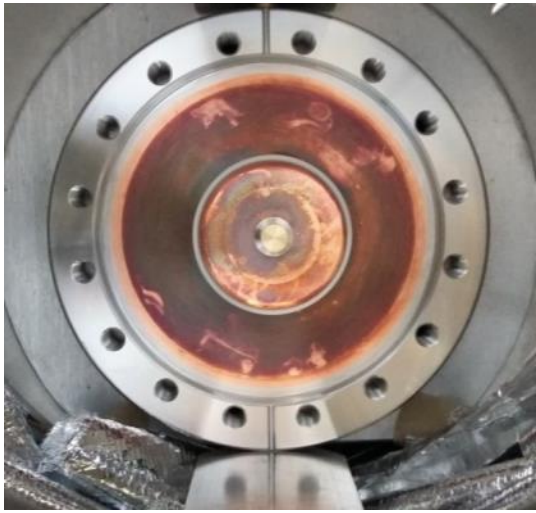
- Issues
  - During the assembly of coupler warm part on the position #4 of XM18 cryomodule, water has been found under ceramic protection cap of coupler cold part THRI-CP-474 (picture 1 on page 2). Some oxidation marks on the coupler cold part copper surface are visible too (left picture).
- Source
  - T… i… wat…
- Correcti…
  - C…
    - …r c…
    - …
    - …n t…



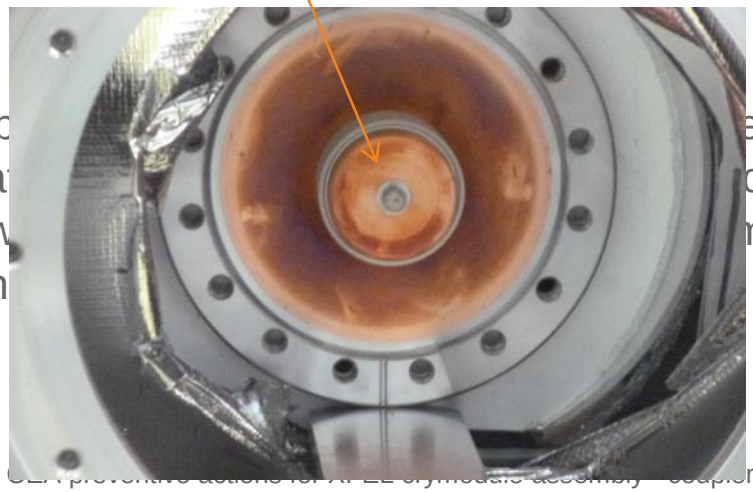


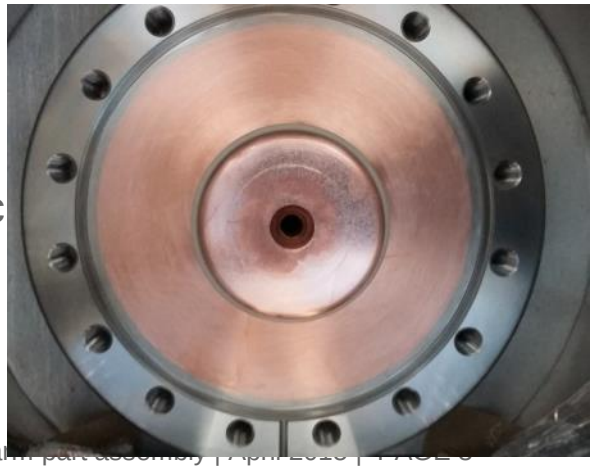
NON CONFORMTIES

Coupler Cold Part (FAQ-2015-0398-3C XM48)



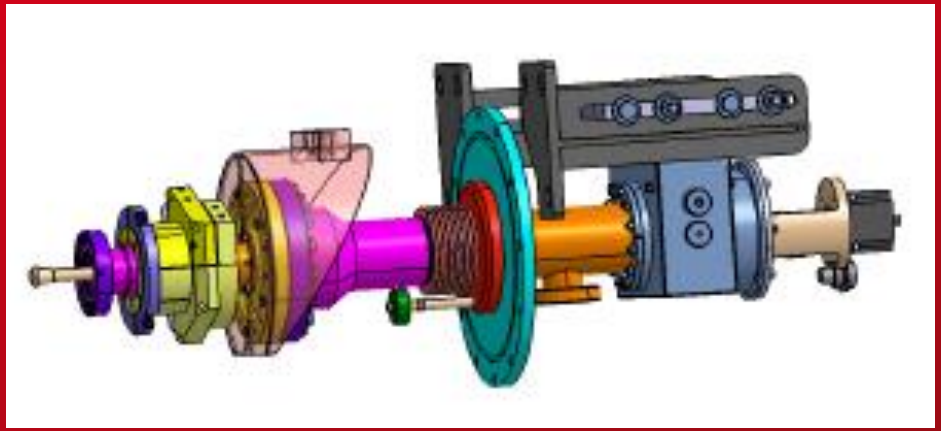
- Issues
  - During the assembly of coupler warm part on several cryomodules, strong coloration of coupler cold part have been found even if we are **not washing** the test wave guide. Some oxidation marks on the coupler cold part copper surface are visible too (left picture). Most of the time the copper under the RF contact is not affected.
- Source
  - Unknown
- Corrective actions
  - CEA:
    - clean the copp… them immedia… ol.
    - The ceramic w… mic acid nor ethan…





FAQ-2014-0258

COUPLER WARM PART ASSEMBLY

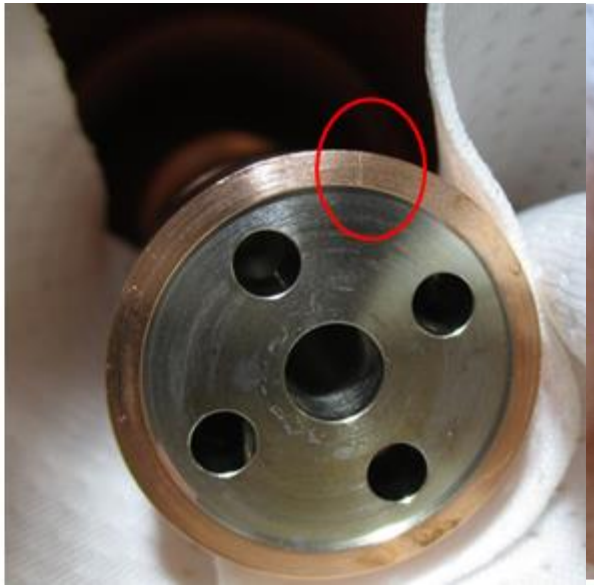


NON CONFORMTIES

Coupler Warm Part

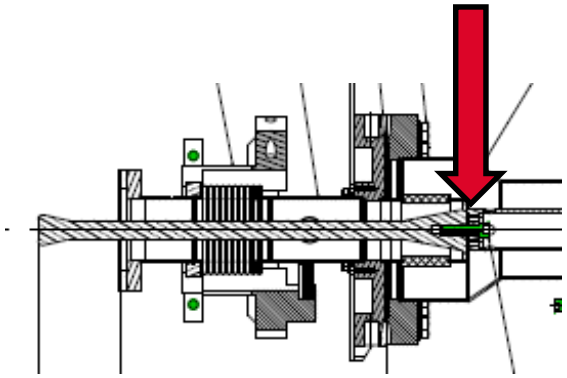
- Issues
  - Scratch on warm part inner conductor (on RF contact)
- Source
  - Disassembly warm from cold part
- Corrective actions
  - LAL: sand paper to remove thickness which risk to compromise the RF contact

Aspect after treatment :



Coupler Warm Part

- Issues
  - T70K overheating
- Source
  - Antenna screw loose

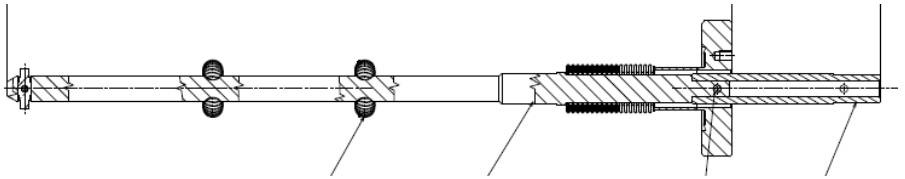


- Preventive actions
  - DESY:
    - New material for central screw and new torque (7Nm instead 5Nm)
  - CEA:
    - Update of instructions file for coupler assembly to take into account the new torque (in addition the number of the turn of the screw is indicated for memory)
    - Use of new torque wrench
    - Operators awareness to the issue
    - Punctual Audit since XM37

NON CONFORMTIES

Coupler Warm Part

- **Issues**
  - Push-rod to adjust variable coupler



  - Pin of the push rod not completely rotated

- **Preventive actions**
  - CEA:
    - Operators awareness to the issue
    - Special Training for operators
    - RF Check coupled with the actuator rotation (the possibility has to be check with the assembly process)
  - Design can be optimized : screws arrangement compatible with 90°rotation

NON CONFORMTIES

Capacitor

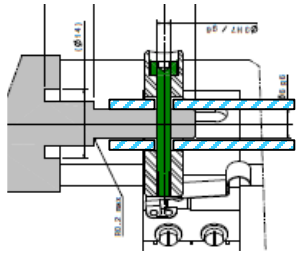
- **Issues**
  - Discharge/burn
- **Source**
  - Capacitor screws loose
- **Preventive actions**
  - CEA:
    - Operators awareness to the issue
    - Control that the operators knew the instructions
    - Torque controlled at 100% and also le nuts M5 in copper behind the WGB (frequently some nuts are loosed => copper elasticity?)

Actuator

- **Issues**
  - Time consuming (20% of the actuators have the screw M3x25 seized during the assembly with the preventive actions)

- **Source**
  - Misalignment holes between PEEK axle of WP, axle of actuator and axle of the big washer
  - Too fine adjustment with the screw M3x25, for this design, in regard of the misalignment

- **Preventive actions**
  - CEA:
    - Use of grease for the screw
    - Drill the hole of PEEK axle at Ø3,1mm

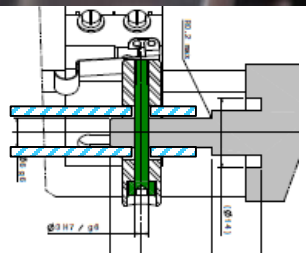


PEEK axle

- **Issues**
  - The complete push-rod need to be exchange if the connecting axle between push-rod and actuator is broken
  - Risk to break the PEEK axle (one broken, one damage)

- **Source**
  - Fragile and preeminent

- **Preventive actions**
  - designer:
    - Use a removable part as TTF3 design



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