Mock-up Cavities & Cryomodule Kit from DESY

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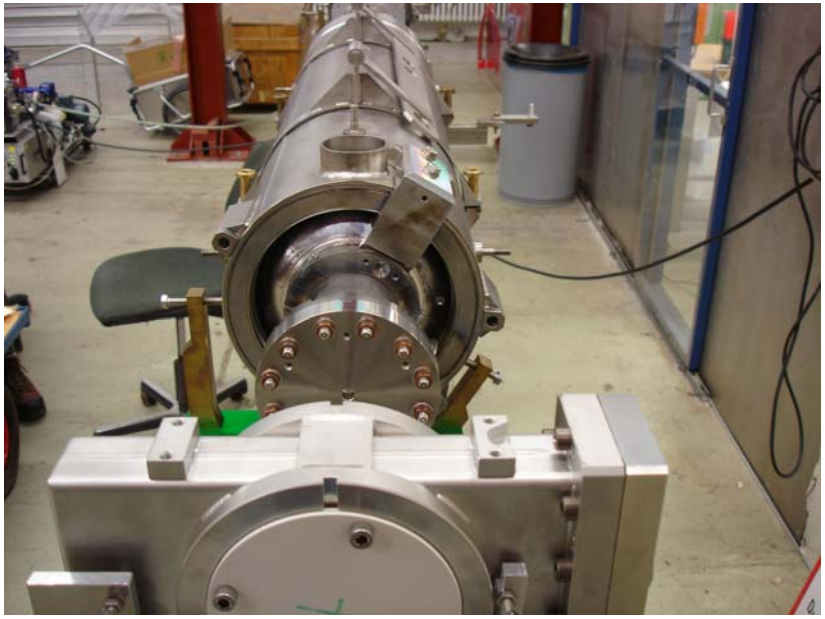
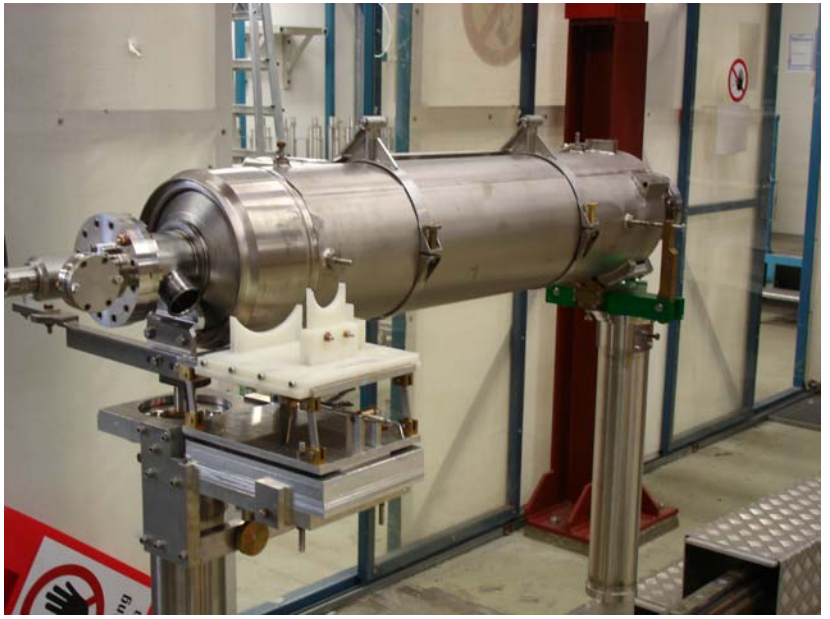
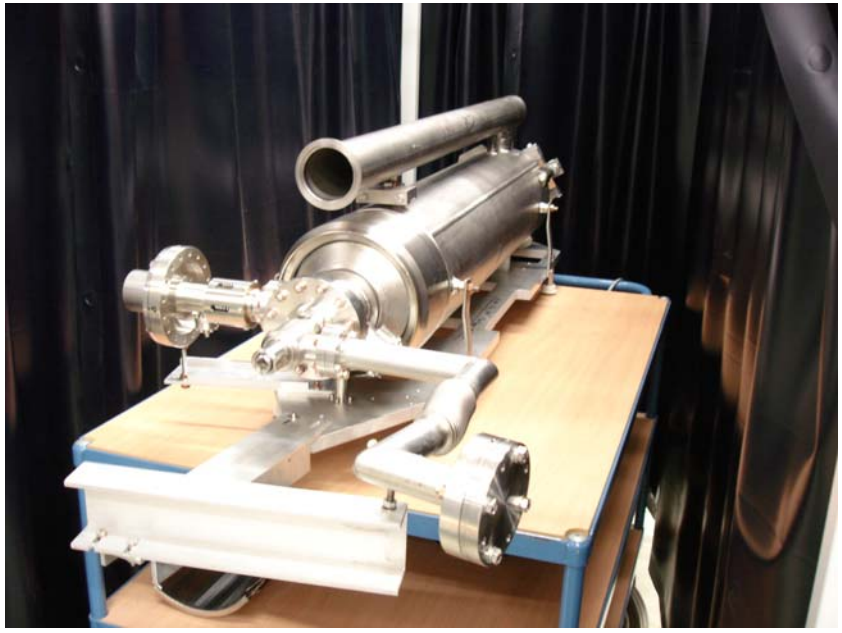
Three Cavities (tank Type 1)

- These are 3 mock-up dressed cavities (C22, C24, C26) used at DESY for the last 2 years to practice cavity string assembly procedures outside of the clean room. (New Training – Refresher Training)
- These are the same cavities that Brian Smith (cavity string assembly lead tech) and I practiced with when we were at DESY for 2 weeks in February 2006. These cavities were removed from the old Module #2.
- They were actually sorted out because the gradients are too low for the Flash application (C22 Eacc 20, C24 Eacc 19.7, C26 Eacc 17.2) .They are foreseen as back up in case something happens to modules at POS Acc1-3 and there are no more cavities available with He tank type 1. (*These cavities must be treated as potential spares for TTF-FLASH and at FNAL they must be handled with care and not to be damaged)*
- These cavities are vented to air for the last 2 years.
- There are not BCP/EP processed, and high pressure water rinsed since 2 years.
- Main input coupler / HOM antennas are not installed for these 3 cavities
- Standard NbTi flanges for beam tube and input coupler. Helico-flex flanges for HOM. The cavities will be shipped with all the flanges blanked off.
- 2-phase Helium supply pipe above the cavity at 12 o'clock position.
- DESY is awaiting wood boxes and crates to be built before they can ship the cavities to Fermilab. Because the input coupler is not installed, sophisticated (coupler shipped vertically, shock monitor sensors etc.) shipping fixture is not necessary.
- Expected shipping date from DESY: Second week of October 2006







Power Couplers from DESY

- There are DESY Type 2 or 3 couplers available that are good enough for horizontal test cryostat application but are not for use in modules because of possible long term reliability problems. They use standard Al gaskets.
- The difference of the cold parts of TTF2 and 3 are:
  - different cavity flanges (some of TTF2 have Helicoflex and all TTF3 have Al seals), some of them have a brazed antenna (TTF2 = soft).
  - Warm parts: TTF2 has a wave guide window; TTF3 has a cylindrical window as part of the warm coax.
- Summary: DESY will send us 2 input couplers (cold and warm parts)

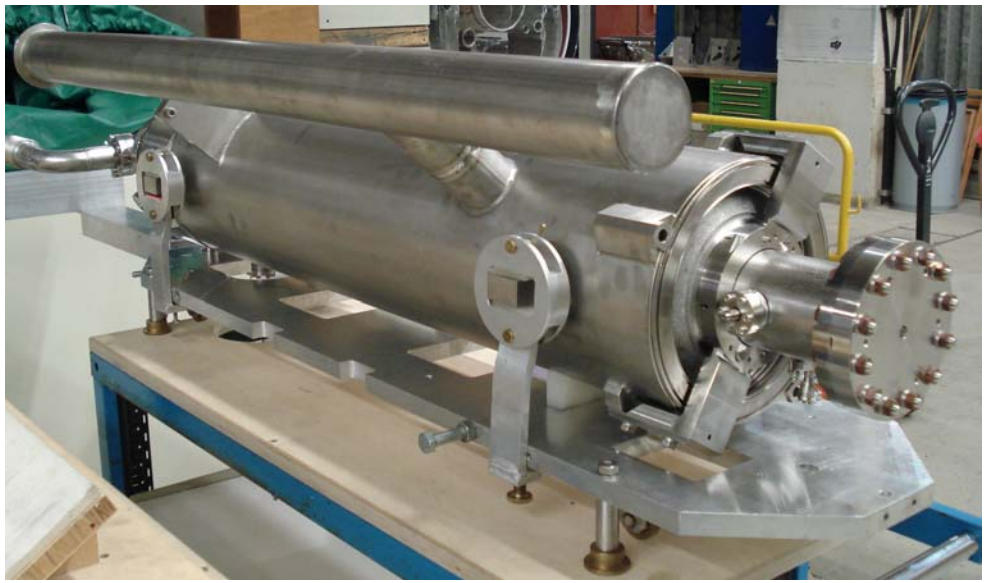
Plans to use these 3 cavities at FNAL

- CAF-MP9 Cavity String Assembly Clean Room:
  - Shake down the input coupler assembly tooling, string assembly tooling and related infrastructure
  - Shake down planned assembly work flow
  - Practice particulate free flange assembly (PFFA) techniques learned at DESY
  - Practice particulate free cavity to cavity assembly procedures.
- Other possible usage area:
  - Horizontal test stand mechanical shake down (vertical 2-phase helium supply could be a problem)
  - If we decide to use one of these 3 cavities for cross check the horizontal test stand at FNAL and at DESY, then FNAL may have to ask DESY for help at “dressing” that cavity. In particular this will require, chemical processing, HPR, input coupler installation, tuner (end tuner type), magnetic shielding installation, testing at DESY and shipping the cavity back to FNAL for horizontal testing.
  - Any other suggestions?

1st Cryomodule Assembly Plans

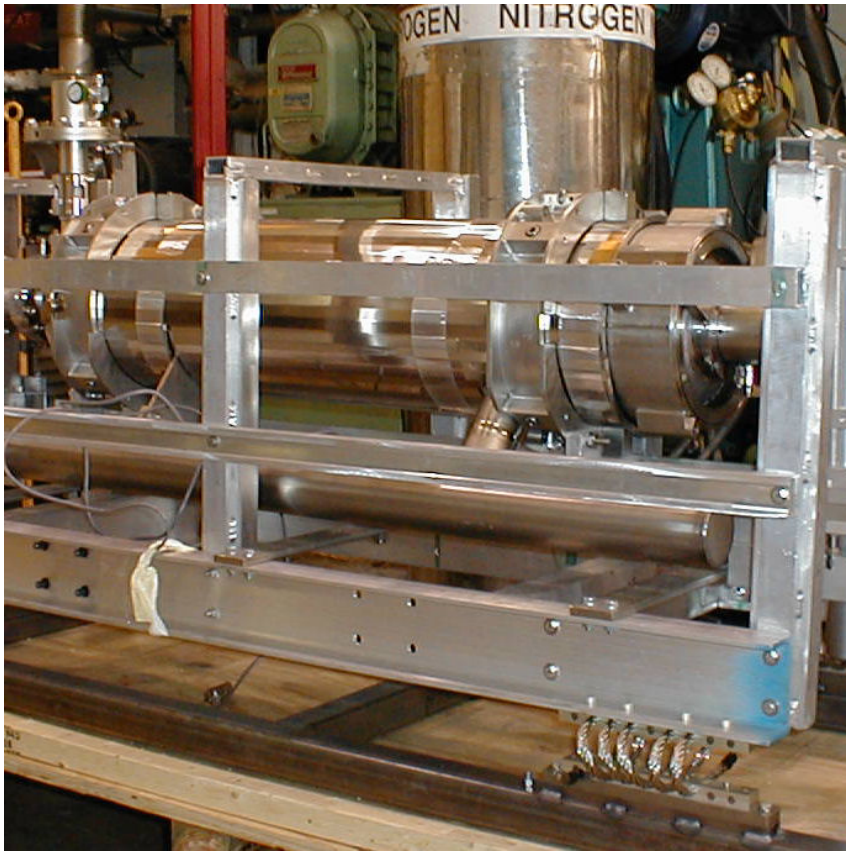
- Cavity String Assembly Procedures & Fixtures Learning at DESY (February 20 –March 3, 06) [Completed]
- CAF-MP9 Clean Rooms operational: [Completed]
- Install Cold Mass Assembly Fixture at CAF-MP9: [Completed]
- Cryomodule #6 Assembly Procedures Learning at DESY [Completed]
- CAF-MP9 Infrastructure ready & operational: **November 2006**
- Install Vacuum Vessel Assembly Fixture (Big Bertha) at CAF-ICB (**December 2006**)
- Practice string assembly procedures with mockups and new installed infrastructure at CAF-MP9 (**Fall 2006**)
- Assemble 1st Cryomodule (4 months): Start date depends when we receive the kit from DESY **(latest update from the TTC meeting at KEK, planned shipping date: February 2007):**
  - 2 spare cavities (dressed, horizontal tested at 25MV/meter gradient) for Module #6 at DESY are ready to be sent to FNAL immediately as a part of the 8 cavities from the kit.
  - What exactly we will receive from DESY as a part of the kit? Need a BOM as soon as possible.

AC 75 for FNAL Cryomodule #1



CC #2 shipping from DESY,

Currently we have 1 shipping fixture



Plans for two Type 2 cavities

- These 2 spare cavities from Module #6 will arrive to Fermilab by early to mid November 2006:
  - Shipping Fixture is ready to be sent to DESY
  - 2 weeks to ship the fixture to DESY, installation of the cavity for shipment at DESY, ship the fixture with the cavity back to FNAL
  - Should we have more shipping fixtures for the near future? (February 2007)
- These two cavities are part of the first cryomodule kit. The cavities are qualified and ready to be assembled into a string.
- Safest approach is not to use these cavities for any shake down. Store them (evacuated as they were shipped, probably do a leak check to evaluate the safe trip between DESY-FNAL) in the CAF-MP9 Class 10 clean room until we are ready to assemble the cavity string. Any other proposal?

CAF Infrastructure Setup Status

- CAF-MP9 Clean Room Argon – Nitrogen gas distiribution lines were installed under the raised floor. Cryogenic Gas micro bulk dewars are scheduled to be installed the first week of October 2006
- Ultrasonic cleaner (large enough to soak a dressed cavity horizontally) is currently being installed at the outside east end of the clean room next to the material access door. Expected completion (middle of October 2006)
- 75% of the cavity string assembly tooling is in house. Start shake down when the mock-up cavities from DESY arrive
- ICB building is started to be cleaned up. LHC tooling is started to be moved to IB3. The first phase was to move the coil winding machine and the curing presses on the south end of the building. Big Bertha will be installed at this footprint. (CAF-ICB)