ILC HiGrade
WP7 Couplers

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Summary

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   2. Process
2. **XFEL**
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   2. Process
   3. Couplers results
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   2. 4Hz conditioning
   3. TTF5
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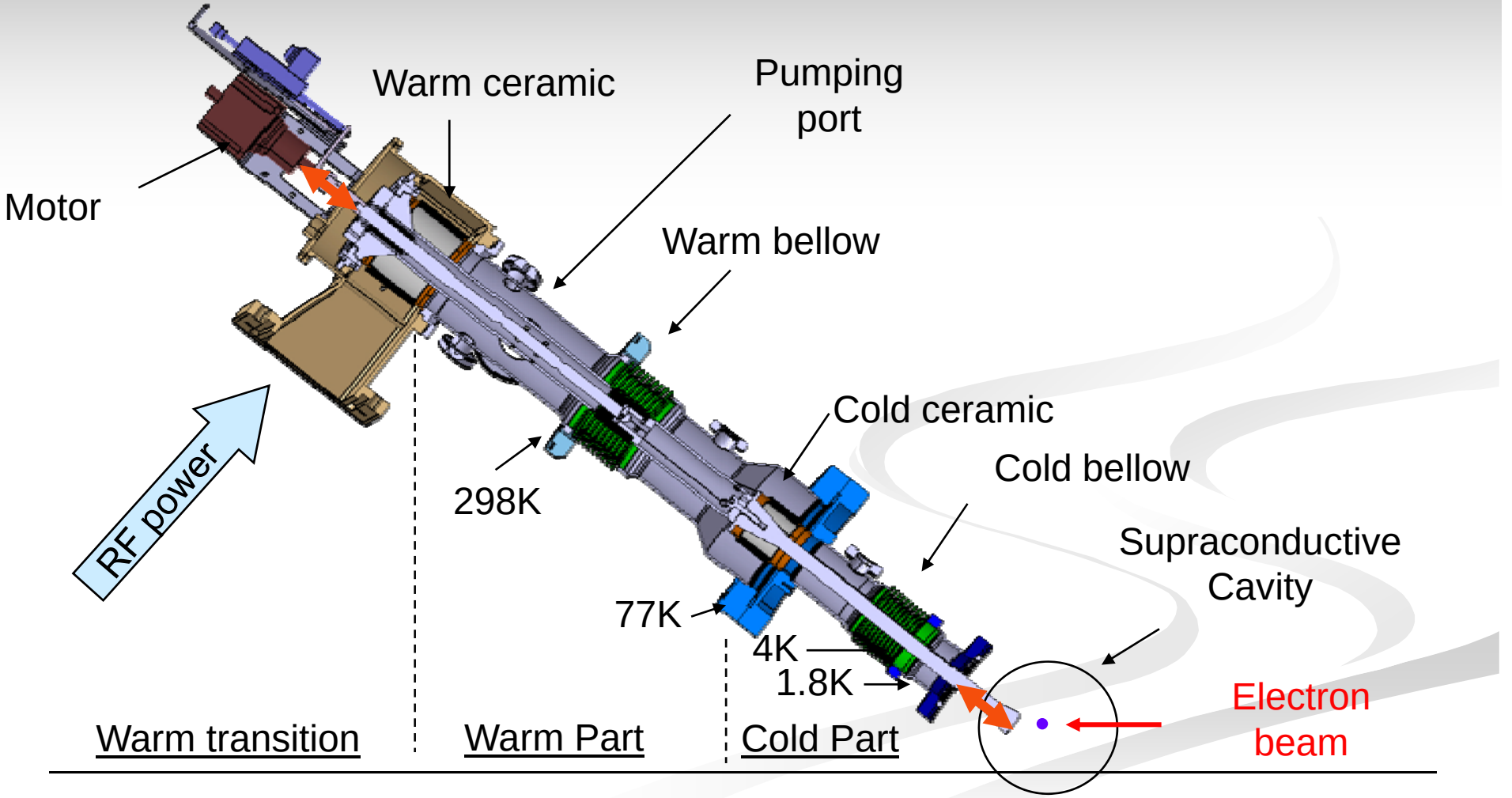
5. **Conclusion**

TTF3 Design

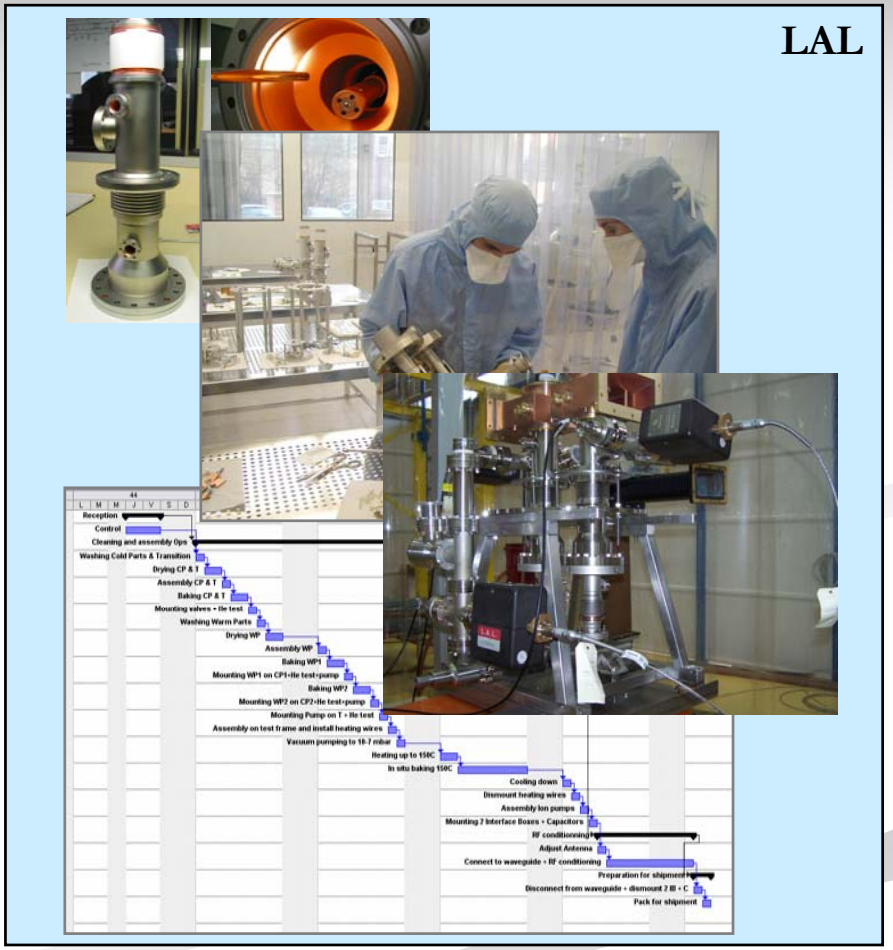

Warm ceramic
Pumping port
Motor
Warm bellow
Cold ceramic
Cold bellow
298K
RF power
Supraconductive Cavity
77K
4K
1.8K
Electron beam
Warm transition
Warm Part
Cold Part

TTF3 Process

Industrial company

DESY

LAL



XFEL Design

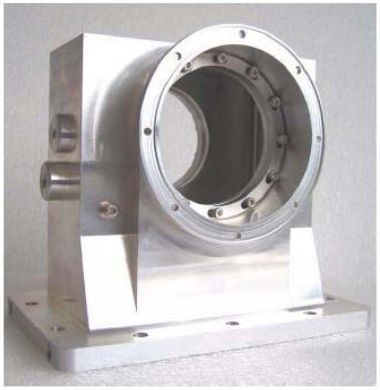
Design to minimize assembly time
(original design: counter flanges + 14 screws

Prototype design

Industrial design

Waveguide to coax interface part

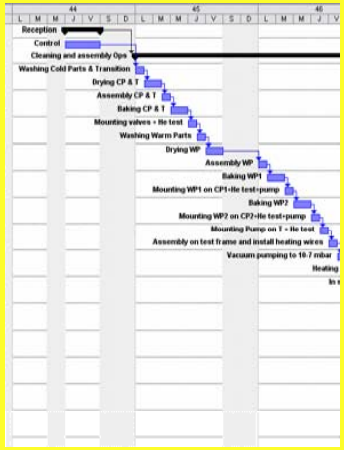
Copper + stainless steel + brass: 13 parts
brazed and soldered



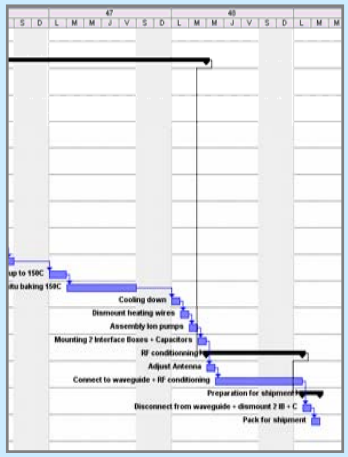
Al alloy: 1 single part
- Prototypes: machined from single block
- Mass production: casting + final machining

XFEL Process

Industrial company



At LAL

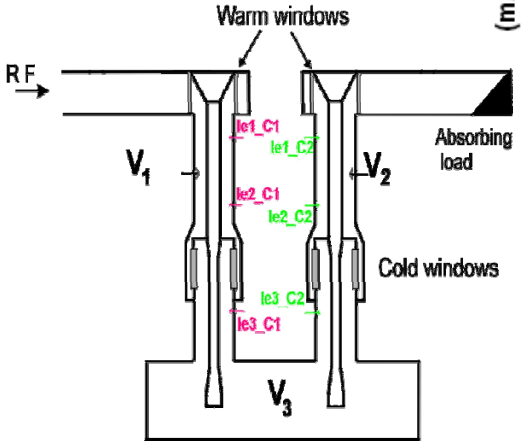


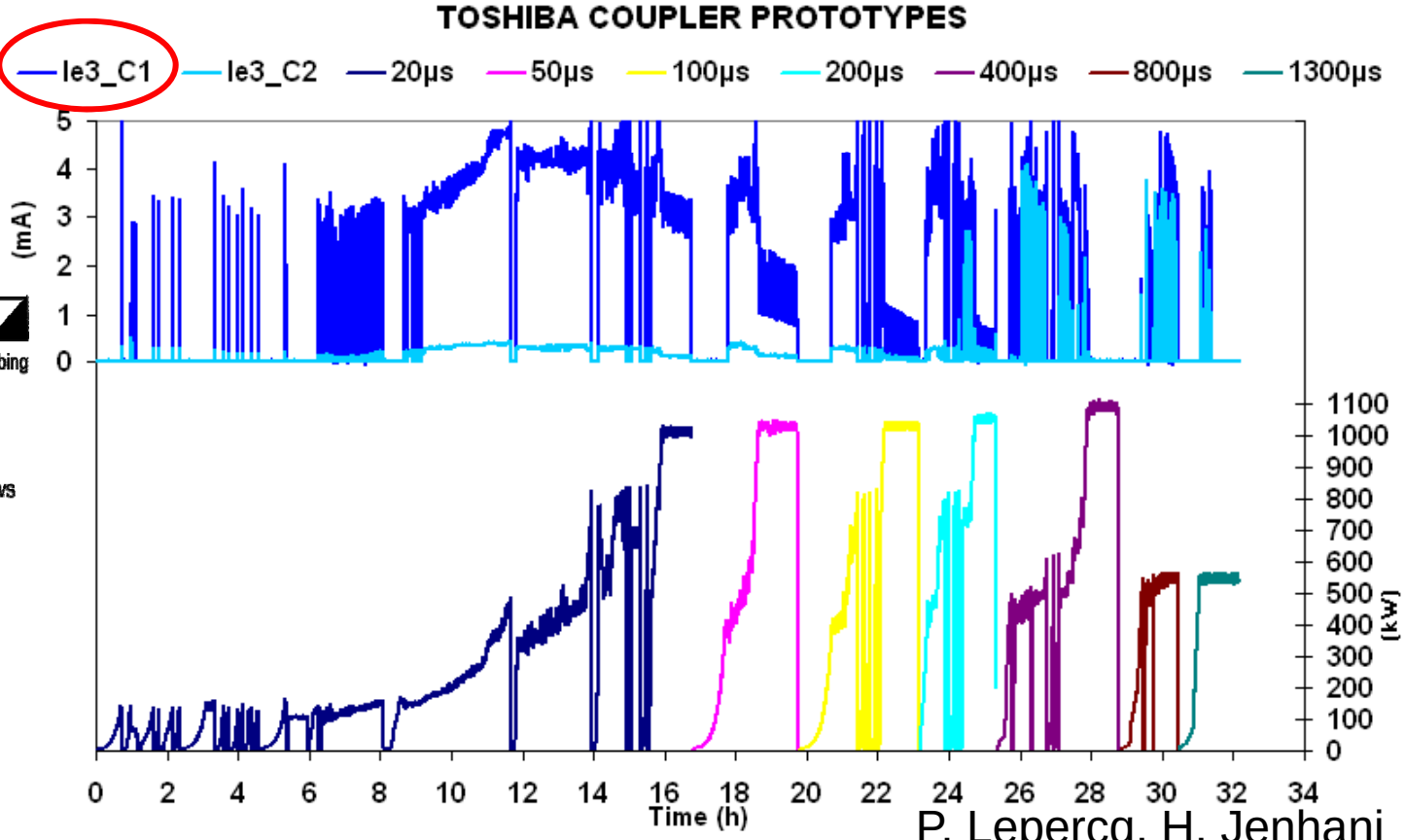
At CEA/IRFU

TOSHIBA XFEL coupler prototypes conditioning

- Totally automated conditioning was **impossible**: conditioning was assisted by operators.
- Conditioning procedure was **modified** several times to pass through high activity power levels.
- **Too many e- current and vacuum interlocks** during the conditioning.
- After the 20µs step: no vacuum interlocks but many e- current interlocks and **very high current fluctuation.**

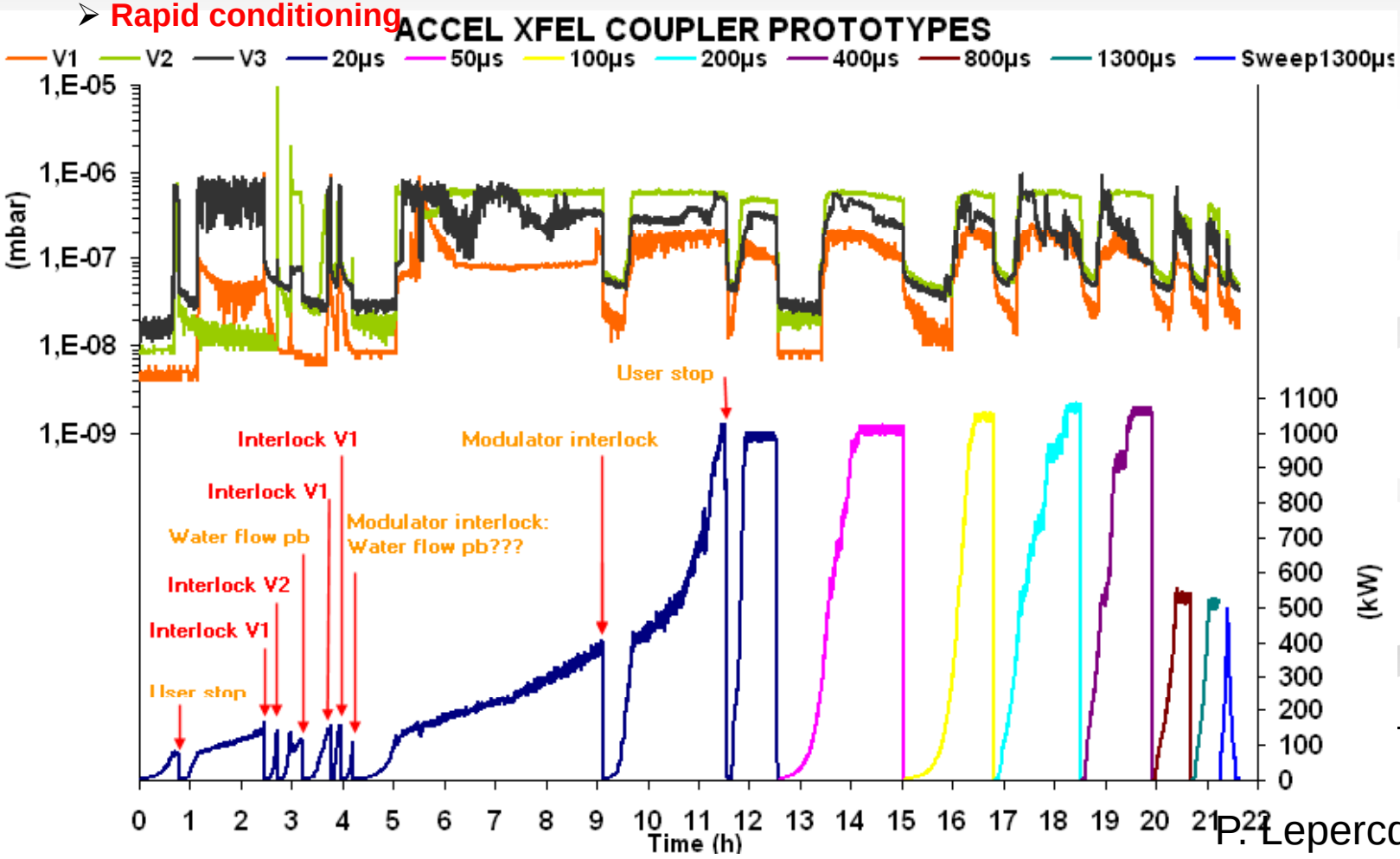
The conditioning wouldn't be possible using the standard conditioning procedure





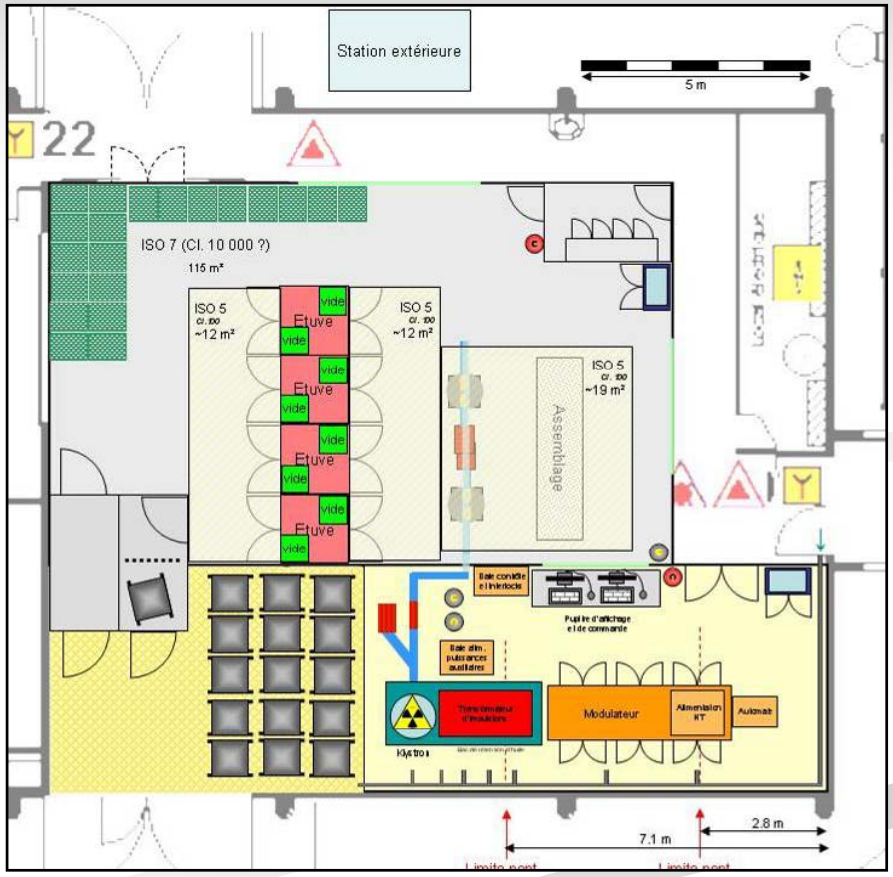
ACCEL XFEL coupler prototypes conditioning

- Automated conditioning (standard procedure)
- Few interlocks and low e- current activity in general
- After the 20µs step: no interlocks
- **Rapid conditioning**



R&D : Some examples

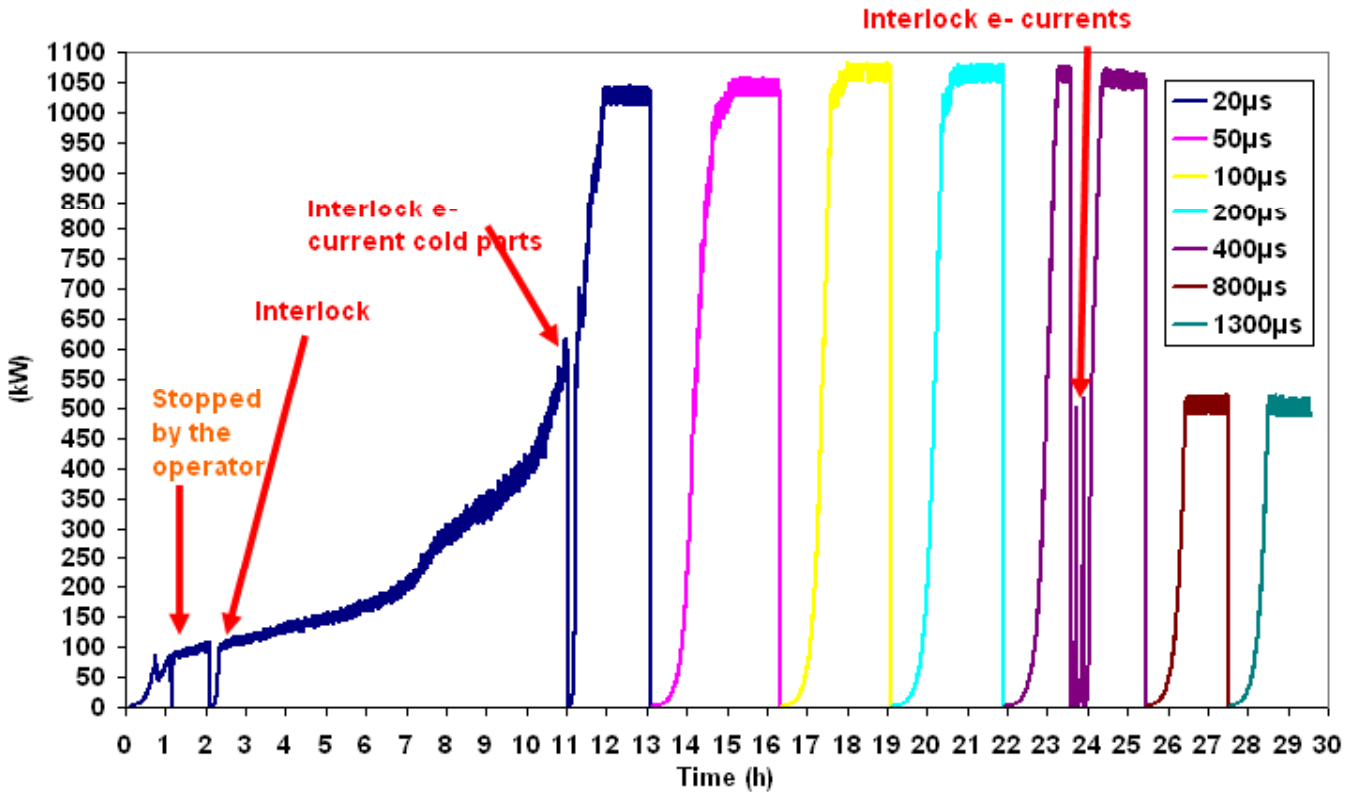
- Design a new XFEL Infrastructure
  - RF station
  - Ovens
  - Mobile clean room class100
- Conditioning of 2 pairs in series



E. Genesseau

R&D: TTF-III coupler RF conditioning (4Hz)

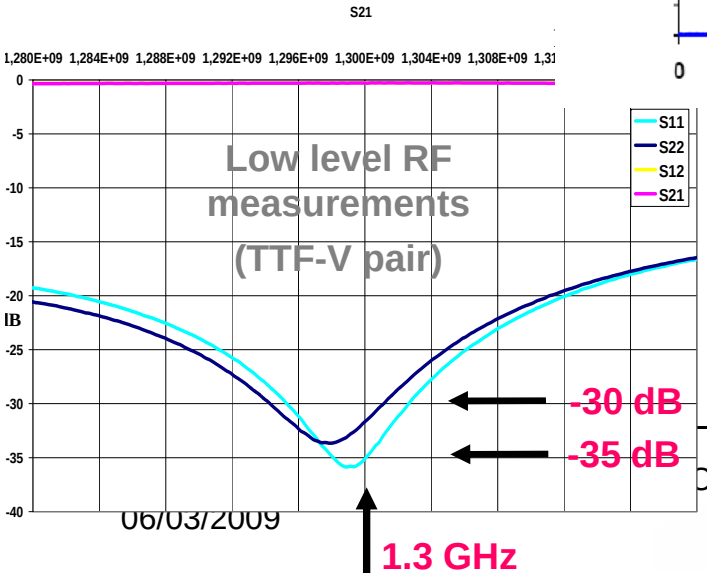
Processed in Feb. 2009

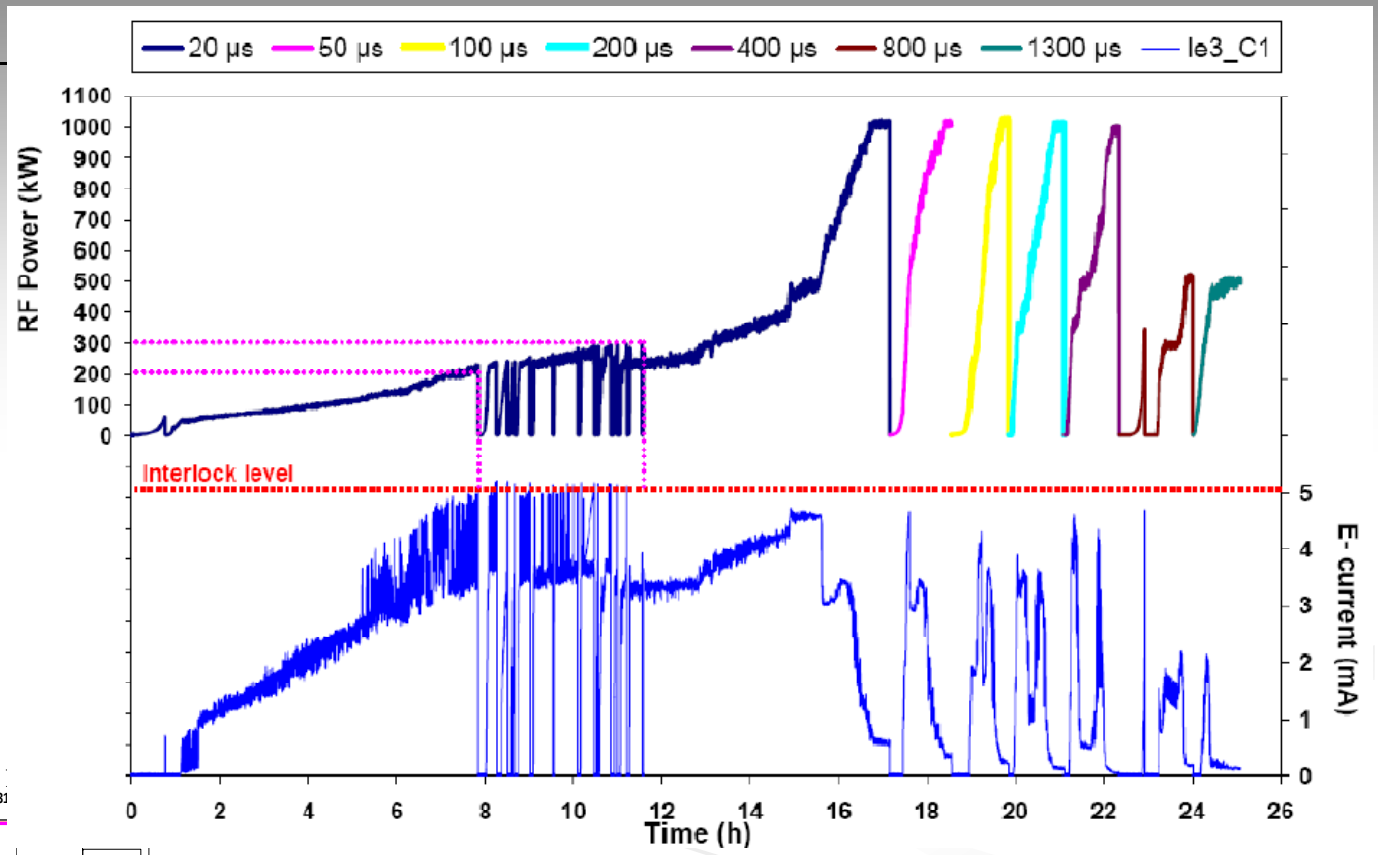


Conditioning of a TTF-III coupler pair (CP3_H45C59_H46C60) using 4Hz repetition rate instead of 2 Hz in order to have **more conditioning effect**. The **conditioning time is comparable** the usual performances.

R&D: TTF-V coupler RF conditioning at LAL

TTF-V coupler pair assembled for the RF tests





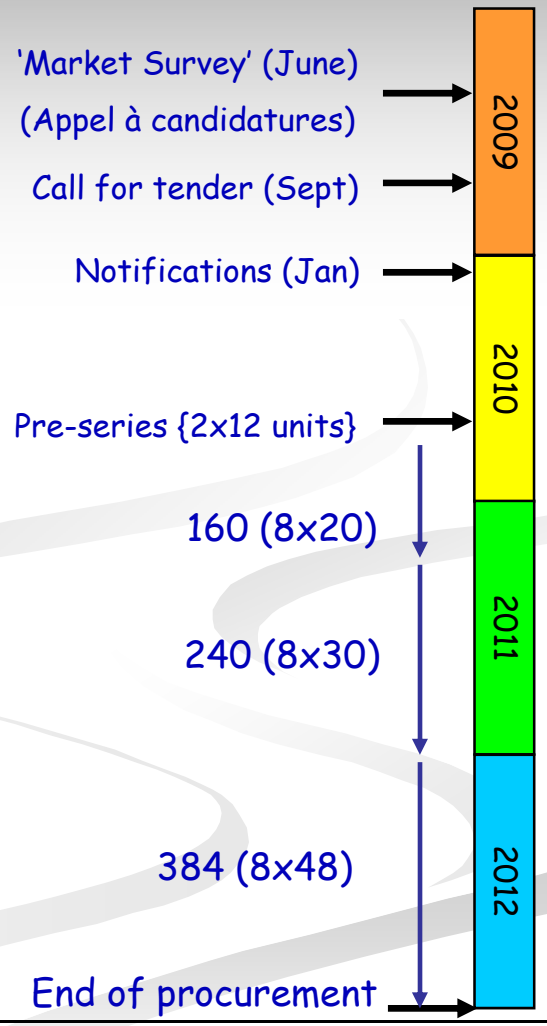
Easy conditioning in 24 h only

Next step: A TTF-V coupler pair will be conditioned at KEK following their conditioning procedure for ILC couplers (March 2009)

XFEL Schedule

- **Tendering dossier:**
- French public market, {restricted market 'marché restreint'}
- Progressive batches if transition conditions are fully performed.
- **Requirements from tenders:**
- Certified materials (certificates 3-1B)
- Written procedures (validation)
- Qualified operators & operations
- Specific samples, before market notification & pre-series
- **During mass production:**
- Quality Control Plan
- Permanent follow up on production site
- Full traceability
- Statistic inspection & performance tests
- **End deliveries:**
- 808 couplers {404 per tender a priori)
- Engineering documents (drawings, calculation notes, etc…)
- Production data (brazing, welding, baking records, etc…)
- Test reports (out gazing, vacuum leak checks, etc…)
- RF processing performance (at LAL-Orsay)

XFEL Schedule by A. Fallou



ILC HiGrade → 1st scenario - baseline

- **Tendering dossier:**
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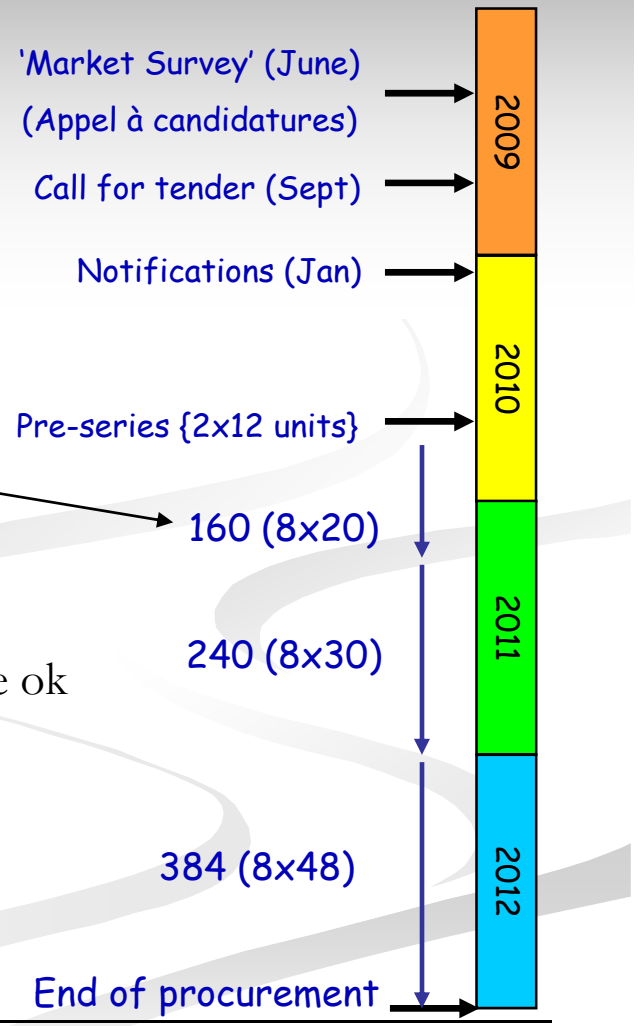
XFEL Schedule by A. Fallou

Add an order of 24 couplers

Beginning-middle 2011
ILCHIgrade couplers are ok



ILC HiGrade → 2nd scenario – XFEL happy?

- **Tendering dossier:**
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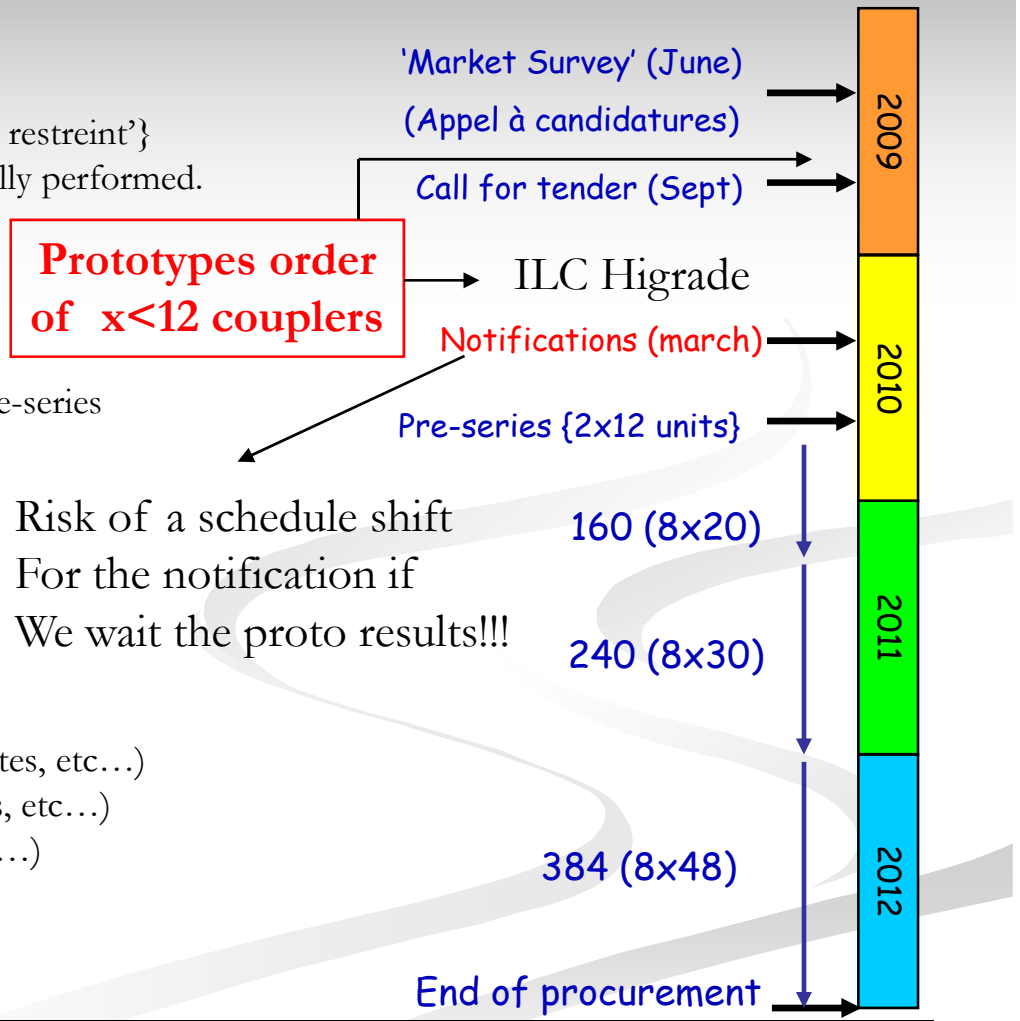
XFEL Schedule by A. Fallou



ILC HiGrade → 3rd scenario

- **Tendering dossier:**
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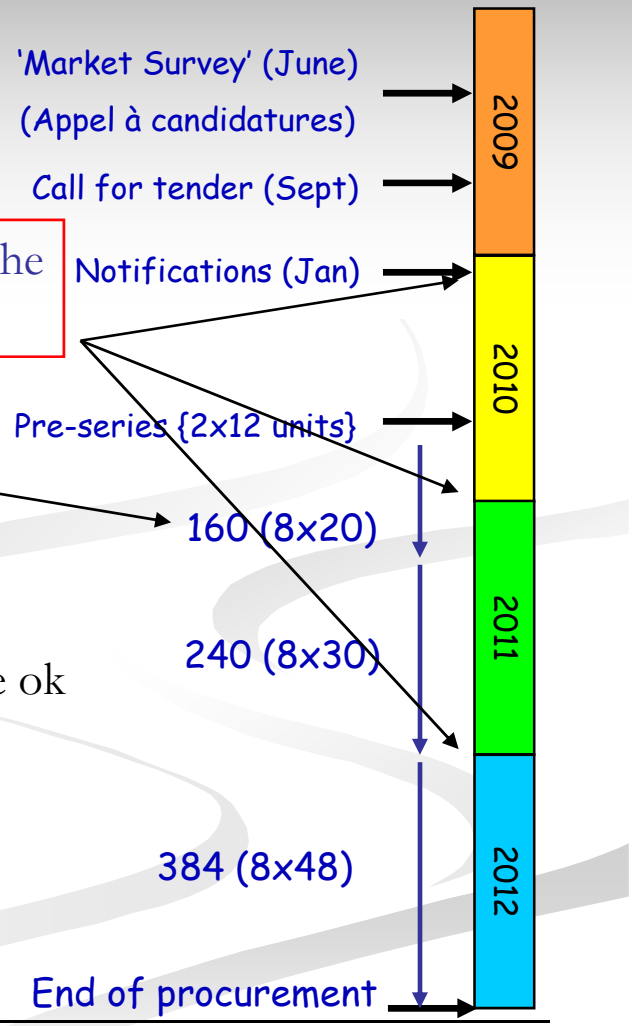
- Written procedures (validation)
- Qualified operators & operations
- Specific samples, before market notification & pre-series
- **During mass production:**
- Quality Control Plan
- Permanent follow up on production site
- Full traceability
- Statistic inspection & performance tests
- **End deliveries:**
- 808 couplers {404 per tender a priori)
- Engineering documents (drawings, calculation notes, etc…)
- Production data (brazing, welding, baking records, etc…)
- Test reports (out gazing, vacuum leak checks, etc…)

XFEL Schedule by A. Fallou

Scientific reports based on the exisiting TTF 3 30 couplers

Add an order of 24 couplers

Beginning-middle 2011
ILCHIgrade couplers are ok



Pros and Cons

- 1st scenario:
  - seems ok
- 2nd scenario:
  - need new people in the staff to follow this contract
  - Could XFEL be delayed to get the results before XFEL notifications?
- 3rd scenario:
  - is it feasible without declaring spent money?

Conclusion

- **Define an ILC HiGrade Delivery Schedule with all the work packages**