Project Manager’s Report

presented by Marc Ross - for the ILC Project Managers:

Marc Ross - (Fermilab),

Nick Walker - (DESY),

Akira Yamamoto – (KEK)

Based on:
‘ILC Research and Development Plan for the Technical Design Phase’
Published February 2009
and
‘ILC Project Management Plan for the Engineering Design (ED) Phase’
Published October 2007

Project Manager's Report:

- **Role of R & D in the Technical Design Phase (TDP)**
- **The new baseline – updating the Reference Design**
- **Focus Topics and Minimum Machine**
- **TDP deliverables**
- **TILC09 and the AAP Review**

3 main aims:

- **In order to achieve our goals we must:**

1) ensure that the internal momentum of the GDE continues to grow and that the tasks the GDE sets itself allow scope for the enthusiasm and commitment of the *international ILC community* to continue to grow;

2) produce the *technical information* required and agreed by the contracting governments as necessary to proceed to approval of the project

3) coordinate the *world-wide R&D programme* to give the optimum return on the investment of the contracting governments.

Basis for our activity:

- **TD Phase R & D is coordinated by the TD Phase Project Management Organization.**
- **The effort is subdivided into fifteen functional Technical Area Groups grouped into three Technical Areas**
- **Each Technical Area Group has a Group Leader who reports to a Project Manager.**
- **The Group Leader is responsible for soliciting, collecting and interpreting Expressions of Interest statements that indicate the contribution a given individual or institution would like to make toward the goals of that Technical Area.**

The GDE Organizational Roles:

- **Project Managers report directly to Project Director**
- **Project Managers (PM) are responsible for**
  - setting technical direction and executing the project for realization of the ILC,
  - day-to-day execution
- **Regional Directors and Institutional managers are responsible for:**
  - promoting, funding and authorizing the cooperative program,
  - using a framework consistent with Institutional and Regional priorities
  - periodic review
- **Project Manager and Regional Director roles are complementary and balanced**

The Organizational structure should serve to facilitate a balance between regional interests and resources and global technical direction

GDE Organization – Practical Aspects

- **Technical objectives are developed by PM with support of Technical Area Groups**
  - Based on *Reference Design Report* Risk Assessment
    - For example: Gradient R&D, electron cloud,
  - PM ←→ Regional Directors communication through Central Team (Executive Committee)
  - Using PM-coordinated collaborative teams
- **Institutional objectives and matching Resource plans are developed by Regional Directors and Institutional Managers**
  - PM and Technical Area Group Leaders develop and manage detailed objectives within these plans
- ***Process forms the basis for a three-way consensus***
  - *Project Managers*
  - *Regional Directors*
  - *Institutional Managers*

Resources:

Basis: *institutional and regional support for science ILC will provide.*

ILC development effort utilizes:

1. **ILC project preparation-specific funding**
   - support for design and cost/risk reduction studies for the TDR
2. **other project-specific funding (XFEL etc)**
3. **generic R&D**
   - support for the development of specific technologies
4. **combinations of the above**

- **Support for the science complements a strong interest in emerging technologies**

‘In-Kind’ R&D

- **provides return for regions/institutions investing resources for technical development**
  - (outside of specific project-preparation work)
- **To ILC:**
  - Beam Studies
  - Infrastructure usage
  - Engineering and Testing
- **To contributing Institute / Region**
  - Technology transfer between partner ILC institutions
  - Infrastructure development and qualification
  - Community connection mechanisms

The role of R&D:

in support of a *mature, low risk design* →

For example:

- **‘To take advantage the ongoing, increasing global investment in SRF’**
  - a big impact of the ITRP decision
  - Improve performance, reduce cost, challenge limitations, develop inter-regional ties, develop regional technical centers

- **This example has both a ‘project-based’ and a ‘generic’ focus**

The role of R&D (2):

The ILC has:

- **A *Baseline Design*; to be extended and used for comparison (RDR*)**
  - But ready for deployment
- **Research and Development activities on Alternates to the Baseline**
  - Engages the community → venue for cost-saving / risk-reduction activities
- **Plug – compatibility / modularity policy → flexibility between the above**
  - The critical role of associated projects – XFEL, Project X, SNS, JLab12, ERLs, …
- **Models of 'project implementation'**
  - The transition from R&D to a real project
  - The link between Technical Phase R&D and the project political process

*** RDR – Reference Design Report**

Project Manager's Report:

- **Role of R & D in the Technical Design Phase**
- **The new baseline – updating the Reference Design**
- **Focus Topics and Minimum Machine**
- **TDP deliverables**
- **TILC09 and the AAP Review**

Reference Design → our Baseline

- **The Reference Design baseline is the most important accomplishment of the GDE.**
  - As described in the Reference Design Report (2007)
  - Created and managed by the RDR management team;
  - strong emphasis on global basis and participation in that process.
  - Reference Design effort was not tightly linked to global R & D coordination and planning
  - it included forward looking decisions → associated risk register:
  - Technical work done in large part at Slac by its Linear Collider design team.

Why consider changing it?

- **What are the new elements in the mix?**

- **R & D Progress → *Significant and Globally Integrated***
- **Plug Compatibility → *Project Management Initiative***
- **the 'Minimum Machine' → *Accelerator Design & Integration***
- **Regional technical and strategic issues → *start of a 'Project Plan'***

new Baseline involves:

1) R&D – *testing* - focused on risk reduction –

- – proving the choices made for the RDR or allowing us to recommend further, new, forward-looking choices,
- – e.g. Electron cloud and Test Facilities

2) Applying and *integrating* global, coordinated R&D

- – *Transition to a Global Project*
- – aimed strengthening technical teams and partnerships - the beginnings of a project plan and a key to expanding the community
- – SCRF ‘Plug Compatibility’ and eye towards industrialization

new Baseline involves (2):

3)R&D – *designing -* aimed at strengthening the basic design

- *Transition to a Global Project*
- Re-opening deferred decisions and understanding different approaches taken by different teams.
- The 'Minimum Machine' design and integration activity → the link between Accelerator Systems and CF & S

- **Strengthening the design will result in cost reduction.**
  - 'global' value engineering - *cost for value* - exercise.

Risk Mitigation R&D

3 identified critical R&D elements of the Technical Design Phase

SCRF

- Gradient Yield (S0)
- Cryomodule (S1-G)
- String test (TTF 9mA, NML, STF)

CFS

- Value Engineering
- Processed water
- Site studies

AS

- DR e-cloud mitigation (CesrTA)
- DR 2pm vertical emittance (ATF)
- FF optics and stabilisation (ATF2)

TD Phase Technical Area Groups:

Table 2.1: TD Phase Technical Areas

	Technical Area		
	1. Superconducting RF Technology	2. Conventional Facilities & Siting and Global Systems	3. Accelerator Systems
Technical Area Groups	1.1 Cavity	2.1 Civil Engineering and Services	3.1 Electron Source
	1.2 Cavity-Integration	2.2 Conventional Facilities Process Management	3.2 Positron Source
	1.3 Cryomodules	2.3 Controls	3.3 Damping Ring
	1.4 Cryogenics		3.4 Ring To Main Linac
	1.5 High Level RF		3.5 Beam Delivery Systems
	1.6 Main Linac Integration		3.6 Simulations

- **This is reflected in the organization.**
- **Technical Area Definitions based on:**
  - project cost ‘drivers’ 1/3:1/3:1/3
  - technical risk
  - project plan

Goals and Milestones

- **what progress has been demonstrated?**
  - From the point of view of R & D, project planning and design work
- **Does that progress lead to the top level goal?:**
  - "The Technical Design (TD) Phase of the ILC Global Design Effort will produce a technical design of the ILC in sufficient detail that project approval from all involved governments can be sought"

Updating the Reference Design with a new Baseline:

- **AAP Context: Are the current management structures adequate to achieve technical readiness for the ILC in 2012?**

→ **Yes; see examples.**

- **AAP Context: Does the current process involve the community such that it is prepared to engage when the decision for construction will be taken?**

→ **Yes; see examples / conclusion.**

- ***Questions (from Project) → to be addressed***
  - ***R & D resources sufficient?***
  - ***What is lacking?,***
  - ***What is redundant?***
  - ***Is overlap with other project efforts effective?***

Examples – Focus Topics →

Project Manager's Report:

- **Role of R & D in the Technical Design Phase**
- **The new baseline – updating the Reference Design**
- **Focus Topics, Accelerator Systems and Minimum Machine ('Accelerator Design and Integration')**
  1. Electron Cloud
  2. Test Facilities
  3. Superconducting RF
  4. Conventional Facilities and Siting
- **TDP deliverables**
- **TILC09 and the AAP Review**

Examples from Context

1. Electron cloud

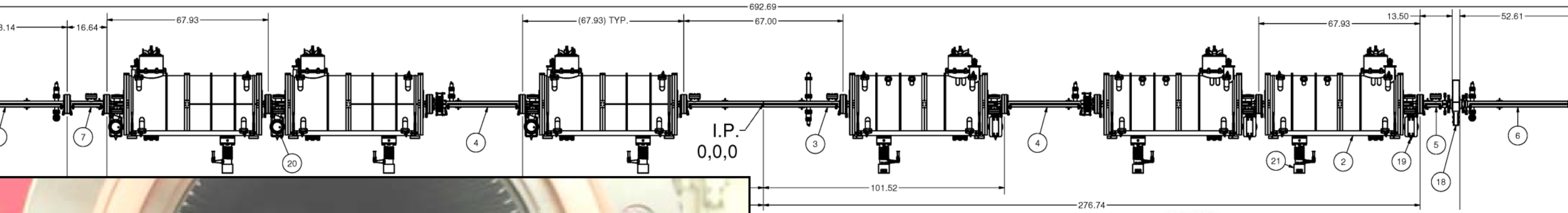
- **Reference Design Report (2007):**
- “Techniques such as triangular or rectangular fins or clearing electrodes need further R&D studies and a full demonstration before being adopted. Nonetheless, mitigation techniques *appear to be sufficient* to adopt a single 6.7 km ring as the baseline design for the positron damping ring.”
- **Will e-clouds impose an operation limit for the ILC?**
  – Theory, Test Facilities, Experimental Status, Required Extrapolation, Mitigation Strategies, Margin and Backup design.
- **e-cloud Test Facilities: CesrTA, PEP II, KEK B, Dafne**

Electron Cloud R & D

- **By mid-2010, CesrTA will have studied:**
  - Coated vacuum chambers → several coatings
  - Electrodes
  - Grooved vacuum chambers
  - (and 'bare' chambers' as control)
- **Cloud density measurements:**
  - Electron analyzers
  - Tune measurements
- **Low emittance tuning**
- **Comprehensive program, includes simulation activities**
  - adequately supported

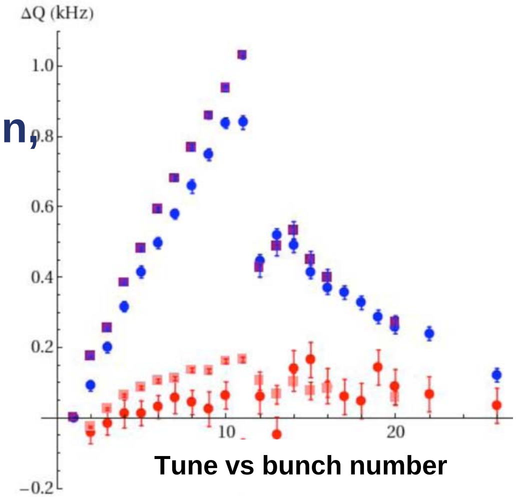
Progress at CesrTA and collaborating labs

Electron cloud: *Cornell*, SLAC, KEK and INFN

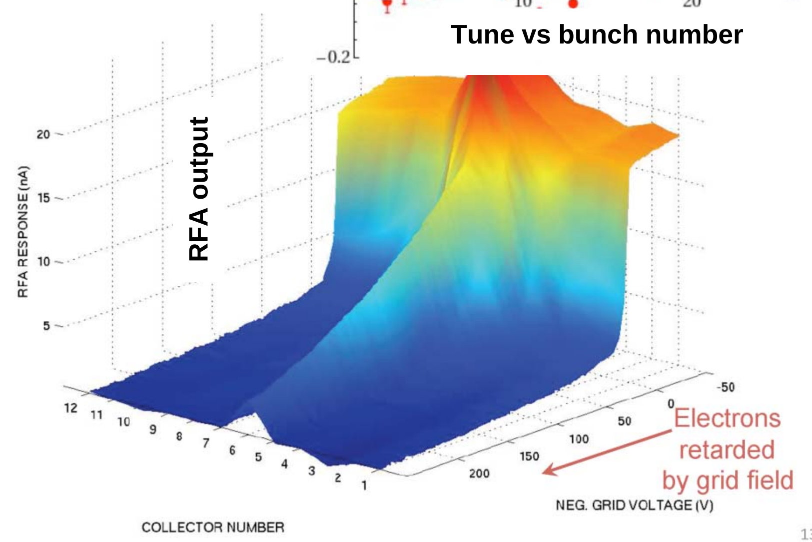


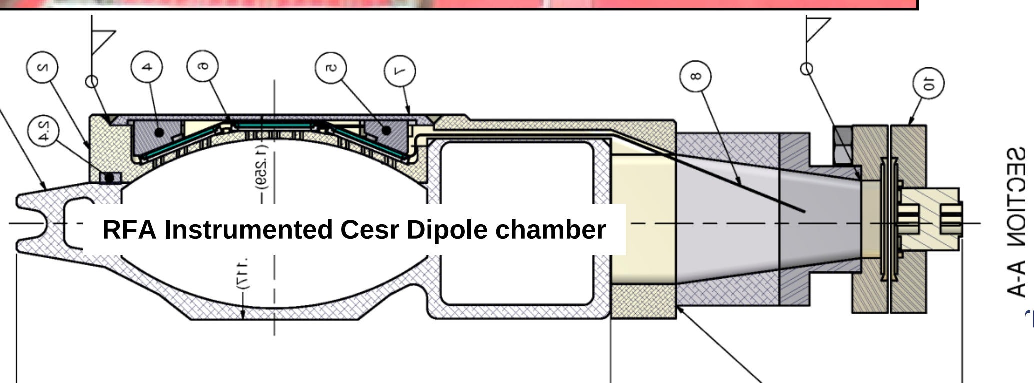
SC Wigglers, mitigation, diagnostics and measurements

SLAC Vacuum chamber – w/fins



Tune vs bunch number





RFA Instrumented Cesr Dipole chamber

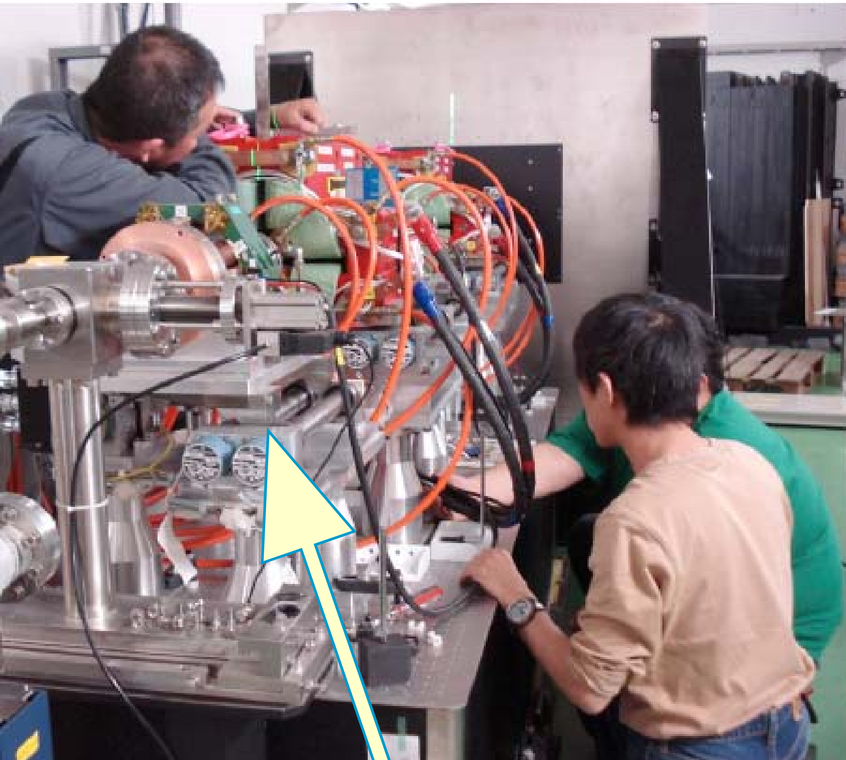
2. Test Facilities

- **Three beam test facilities in operation:**
  - ‘FLASH’ → superconducting linac demonstration (DESY)
  - (CesrTA → electron cloud; damping ring (Cornell))
  - ATF / ATF2 → Damping ring and beam delivery (KEK)
- **Two new facilities foreseen later in TDP**
  - SCRF Linac – STF (KEK), ILCTA-NML (Fermilab)
- **Collaborative activities with INFN, KEK, SLAC…**
- **Important ‘breeding ground’ for community development**
  - ATF2 example
- **Substantial investment – facility and operations**

Damping Ring and Beam Delivery

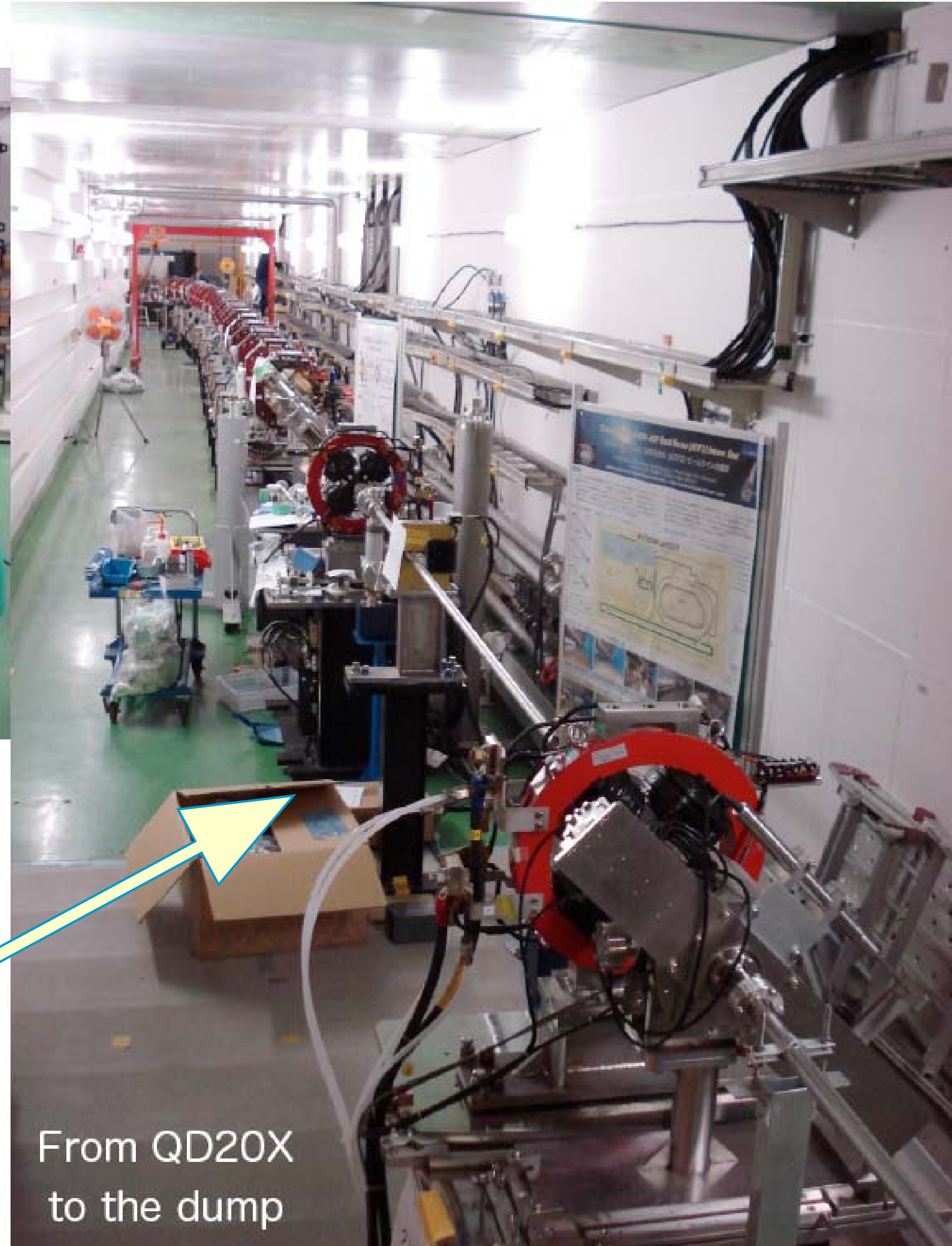
- → **the ATF / ATF2 Program:**
  - Overall Goals;
  - Demonstration of focusing and stability;
  - Demonstration of ultra-low emittance
- **A fundamentally *international / inter-regional* collaboration**

- **Commissioning started 2009**
- **Beam tuning / beam optics studies underway**



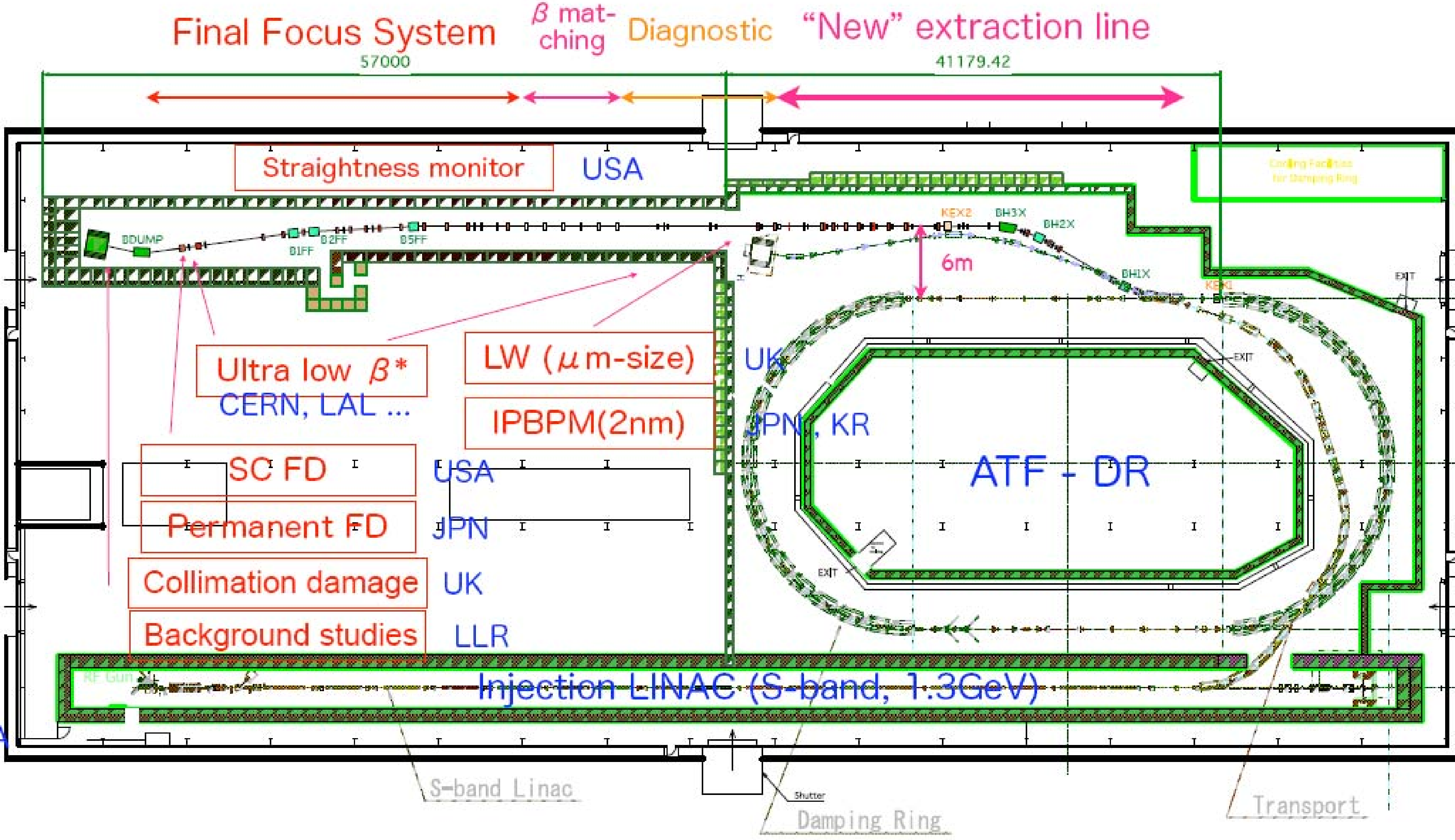
FD alignment after the Radiation Inspection , 11 December, 2008

ATF 2 – Beamline and Final Doublet



ATF2 beam line and planned/proposed R&Ds

2008 - 2010 - 2012 - 2014



ILC Linac Demonstration →

- **R and D Plan (2009):**
- “The effort to realize a cryomodule-string test in each region is highly encouraged as an important milestone for anticipated regional centres for the ILC construction period.”
- **Demonstration will be done at the DESY-based main linac beam test facility FLASH**
- **Nominal ILC performance –**
  – Reduced gradient → (see upcoming talk)
- **The highest priority goal:**
  – **to demonstrate beam phase and energy stability at nominal current**
    - **(includes bunch-to-bunch energy difference and pulse to pulse energy stability)**
- **Fermilab / KEK SCRF linacs ~ 2011**

A string test in each region:

- **Complementary testing:**
  - Each region must develop industry and must develop ‘ownership’ of this critical technology
  - including the cryomodules, beam generation and handling and the RF power source and distribution systems.
- **No one system will represent the baseline reference design RF unit design, *exactly, within the TD Phase time scale.***
  - due to institutional commitments to support parallel projects and also to conventional facilities limitations
  - Limitations:

Fermilab:	KEK:	DESY:
Beam format	number of CM	gradient.

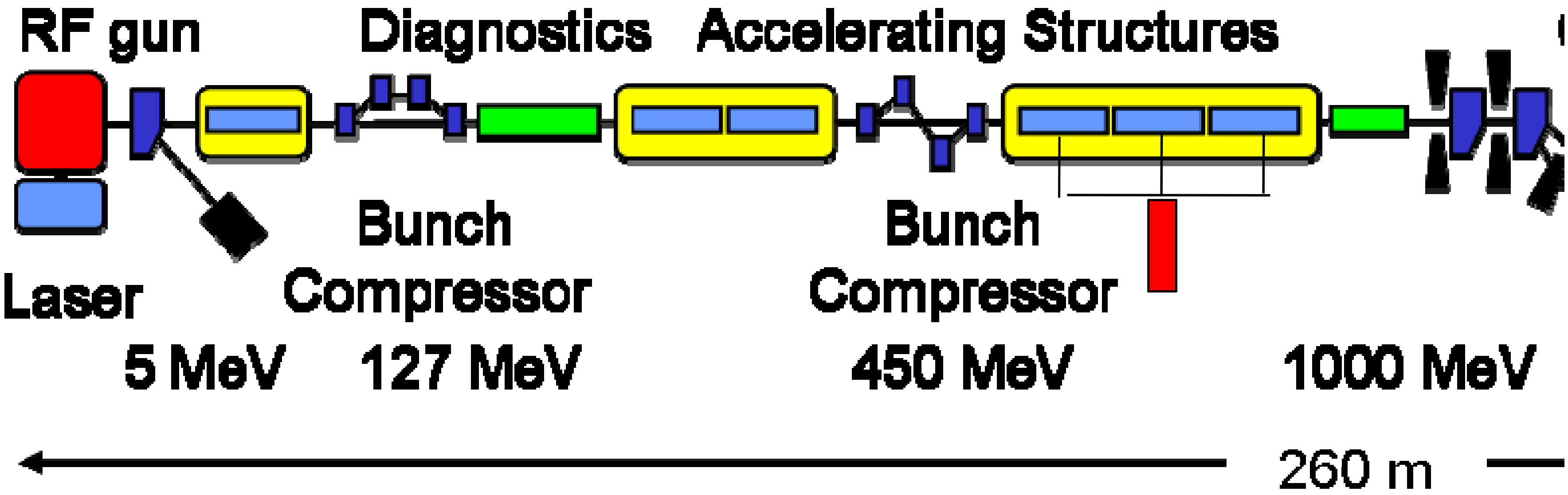
- **Strategy must account for infrastructure limitations and construction schedules at each of the three main linac test facilities under development.**

SCRF Test Linac Goals:

- **In addition, to be done at the above facilities:**
- **Secondary goals - impact on cost:**
  - demonstrate operation of RF-unit,
  - determine power overhead
  - measure dark current and x-ray emission
  - heating from higher order modes
- **Finally - understanding main linac subsystem performance.**
  - fault recognition and recovery procedures;
  - cavity quench rates and coupler breakdowns,
  - testing component reliability,
  - long term testing of cryomodule
  - tunnel mock up

[redacted]

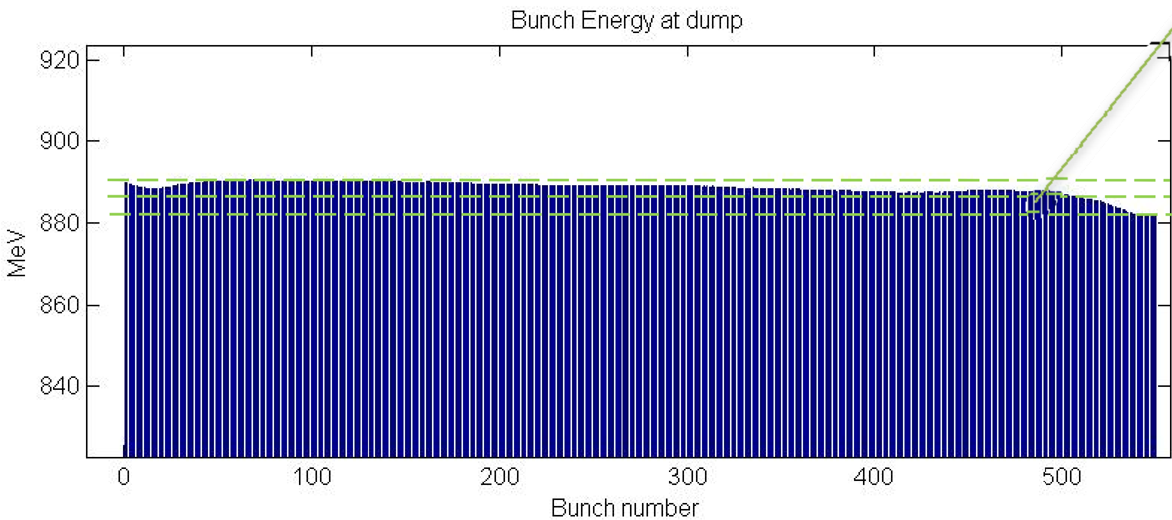
XFEL vs. FLASH experiment

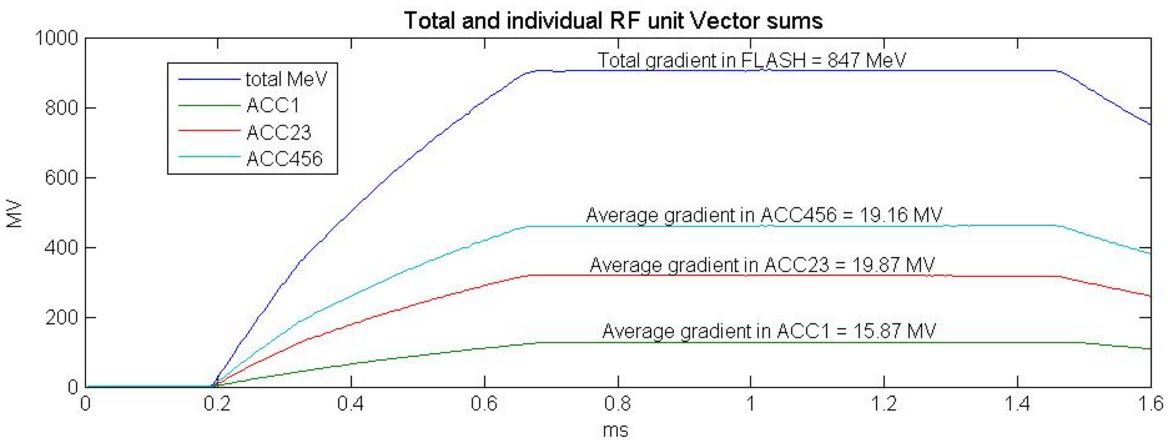


		XFEL X-Ray Free-Electron Laser	ilc	FLASH design	FLASH experiment
Bunch charge	nC	1	3.2	1	3
# bunches		3250*	2625	7200*	2400
Pulse length	µs	650	970	800	800
Current	mA	5	9	9	9

High Beam-Loading Long Pulse Operation

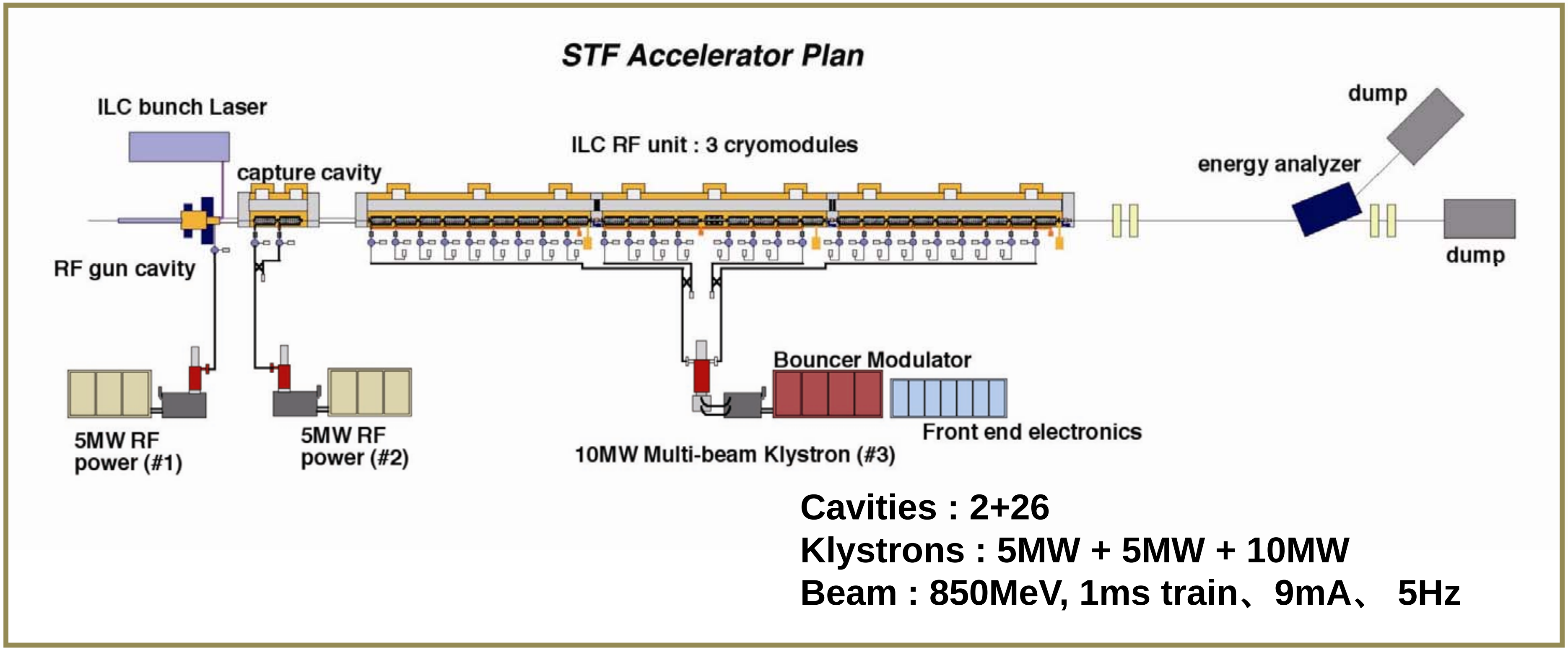
10 MeV over 550 bunches (~1%) (~4 MeV over 1st 500)





- 450 bunches achieved with stable operation
- Long bunch trains with ~2.5 nC per bunch: 550 bunches at 1MHz
  - 890 MeV linac energy
- All modules (RF) running with 800us flat-top and 1GeV total gradient

STF2.0 accelerator plan → KEK



- 3 cryomodules – RDR RF unit
- Fermilab test linac similar

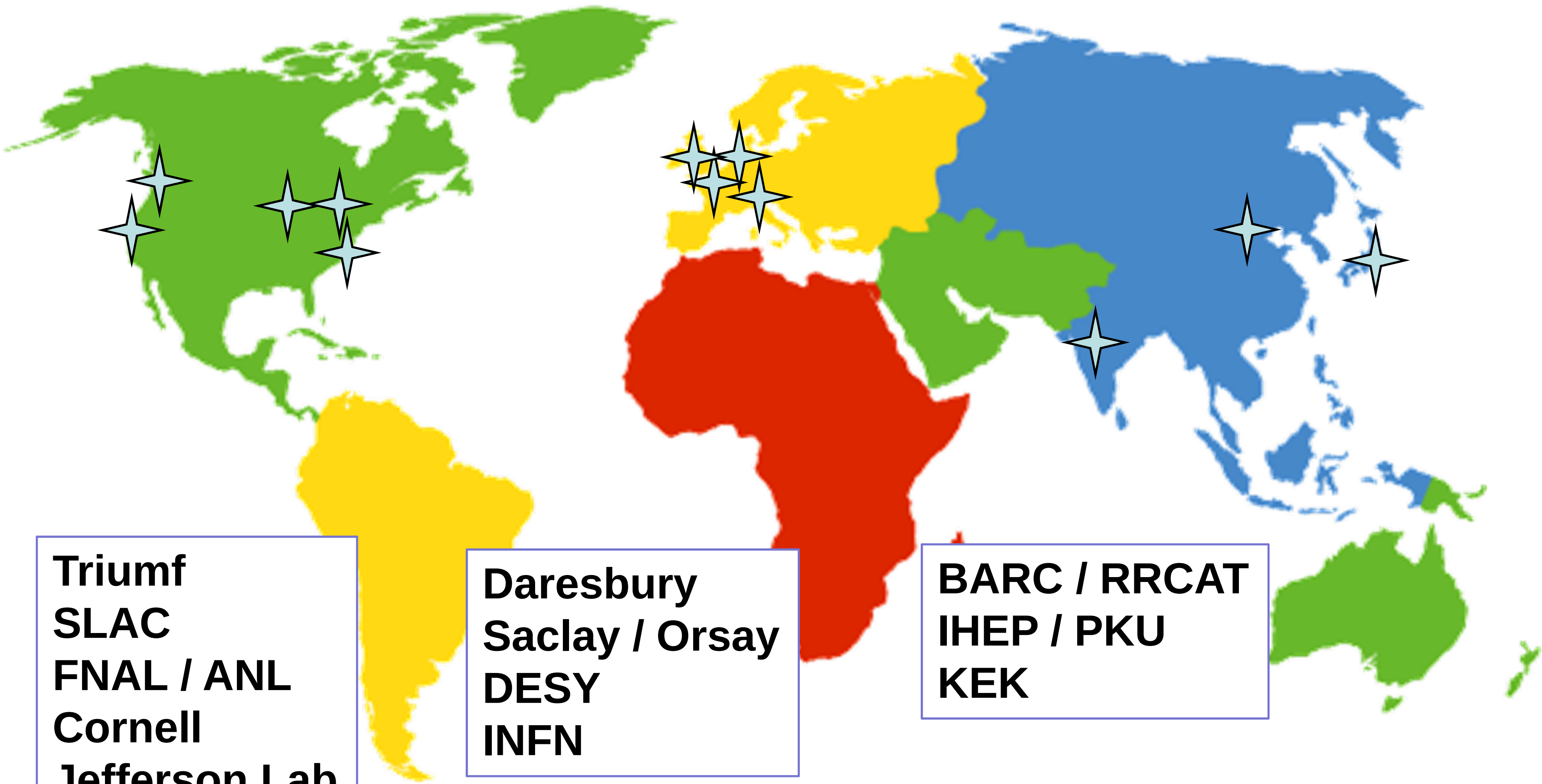
3. Superconducting RF

- **SCRF technology development is a global activity**
  - (See: SRF 2007 / 2009 Workshop Agendas)

For ILC cavities:

- **Demonstrate gradient/Q/radiation performance**
- **Develop full fabrication and processing industry / infrastructure in each region**
  - ***Requires substantial effort and time***
  - ***Critical test-bed for global integration***
- **What has been learned since the RDR was written (2007)?**
  - Process; Instrumentation; Role of fabricators

GDE: *SRF Infrastructure*



Triumf
SLAC
FNAL / ANL
Cornell
Jefferson Lab

Daresbury
Saclay / Orsay
DESY
INFN

BARC / RRCAT
IHEP / PKU
KEK

High Pressure Rinse, Surface processing chemistry (EP), Vertical Test

Plug Compatibility

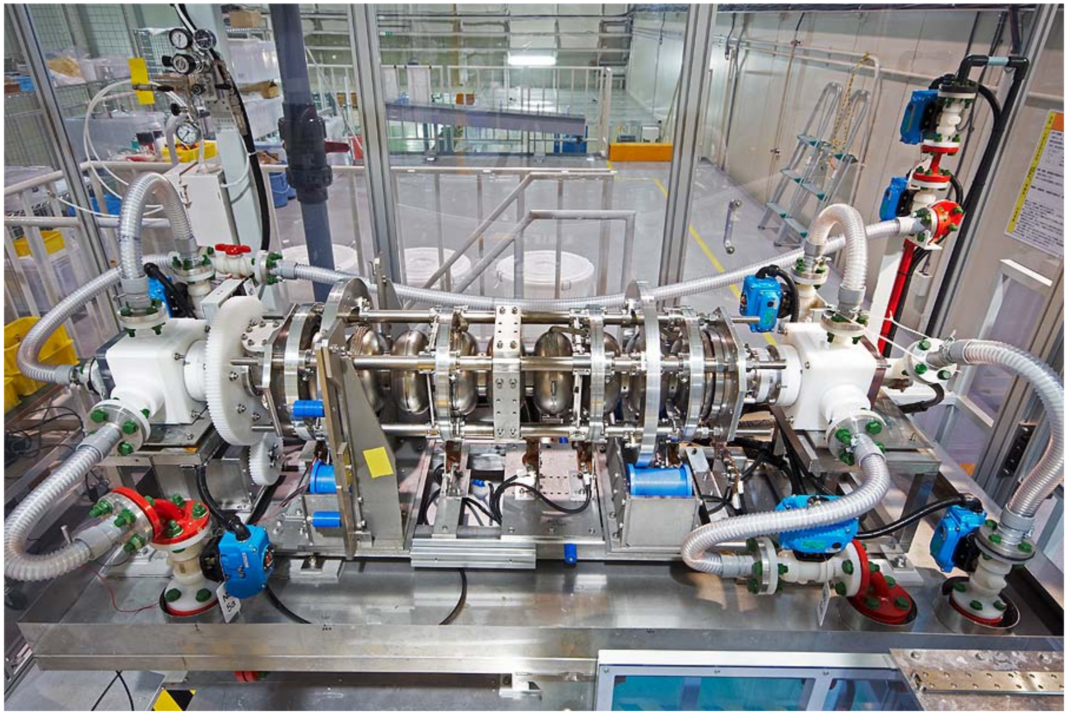
- **Transition from loosely knit collaboration to project**
  - "involve the community such that it is prepared to engage "
  - Define flexibility; develop constraints; promote innovation → 'interface specification'
  - Works well with technical R & D →
    - Facilitates testing and basic development process
- **R & D phase:**
  - important to 'In-Kind R & D'
  - Vital mechanism to promote growth in community:
    - Results in strong partners… at some cost.
- **Link to Project Plan:**
  - Under development

SCRF Infrastructure Goals

- **Within each region, Develop:**
  - Viable industrial partners
  - Demonstrated processing cycle
  - Mature team of experts
  - Demonstrated testing infrastructure…
    - From raw material to beam tests
  - Competence → achieve nominal ILC specifications in each region
- **New infrastructure examples:**
  - STF (KEK) – Vertical testing and diagnostics
  - CPF (FNAL / ANL) – horizontal testing and cryomodule assembly

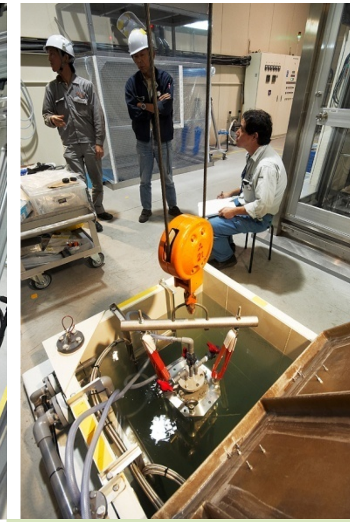
STF Facility Start-up: EP Facility

9-cell cavity on the EP bed



EP acid: HF + H_2SO_4
Aluminum anode,
surface removal speed: 20μm/hour,
~18V ~270A ~30degC
cavity rotation: 1 rot/min

electrode in/out in vertically

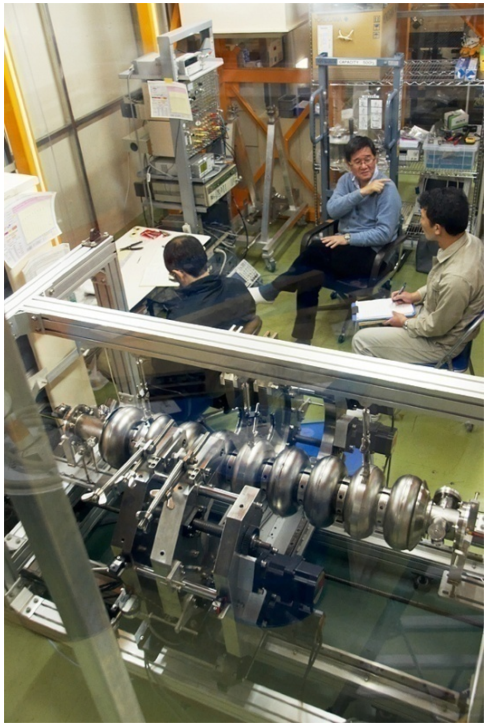


ultra-sonic cleaning

HPR installation

120C bake

STF Facility Start-up : Vertical Test Facility

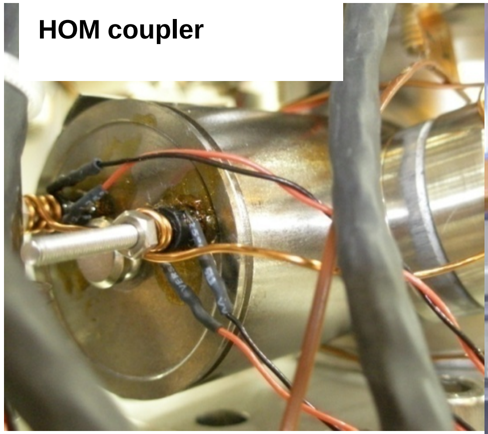


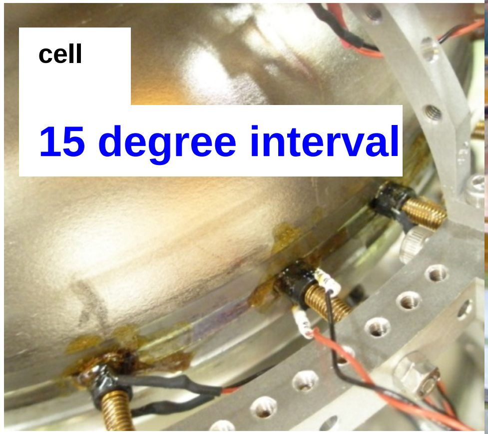
AES001 Pre-tuning tuned to 96.6% flatness.

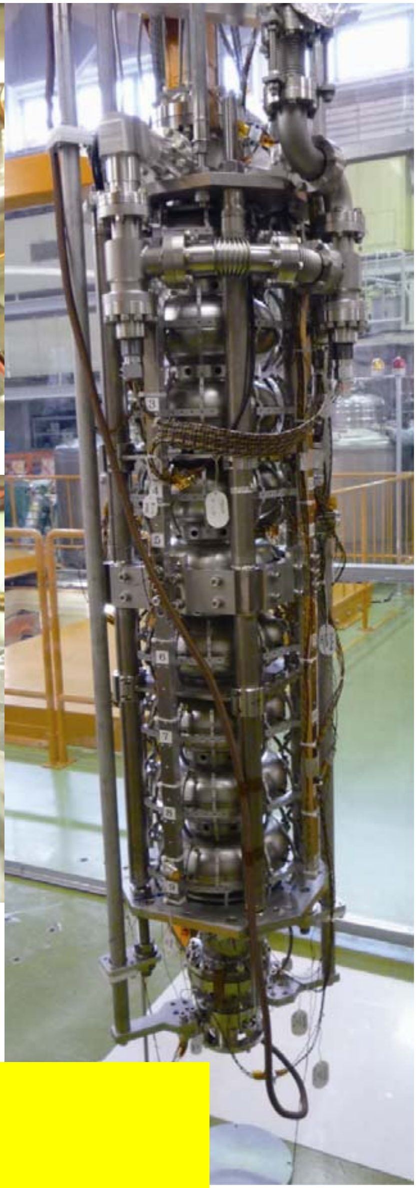
Cavity Installation test and pumping test

Installation test into cryostat

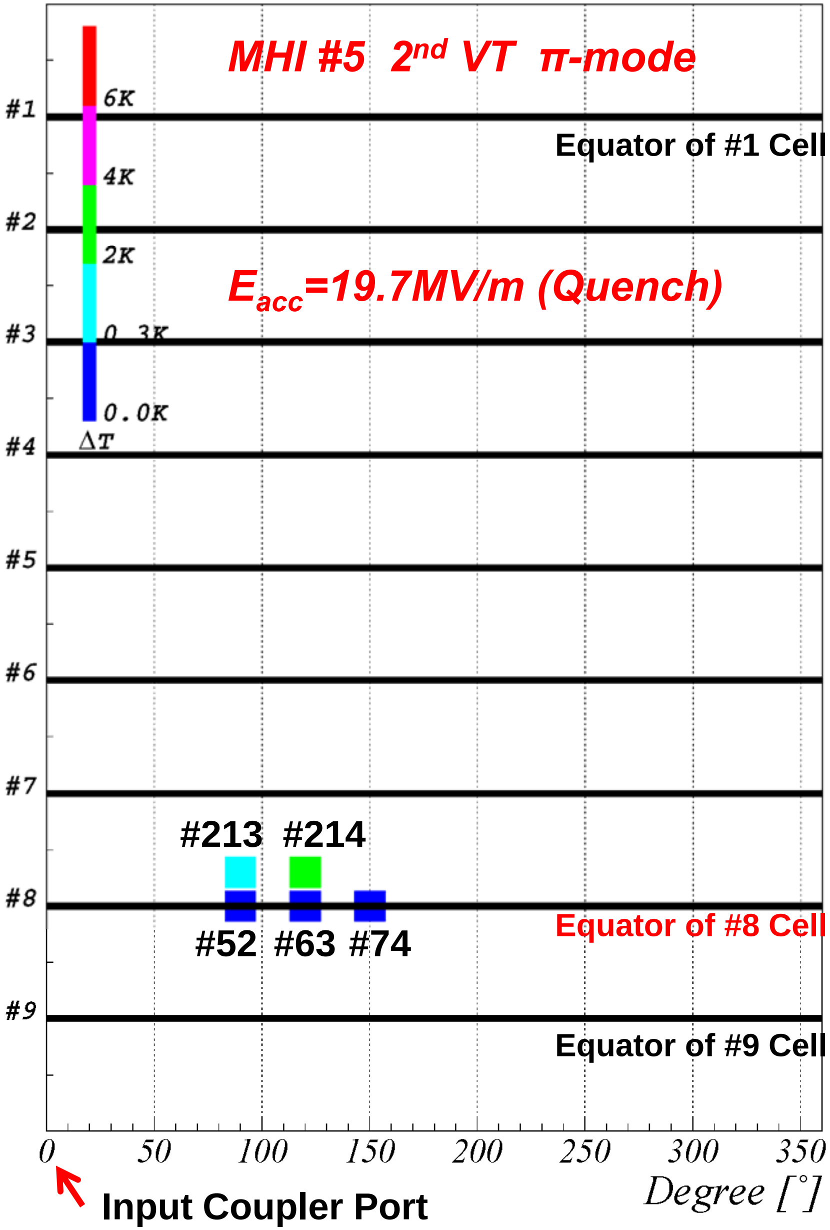
Temperature Sensors (T-map) – coupled with internal inspection camera



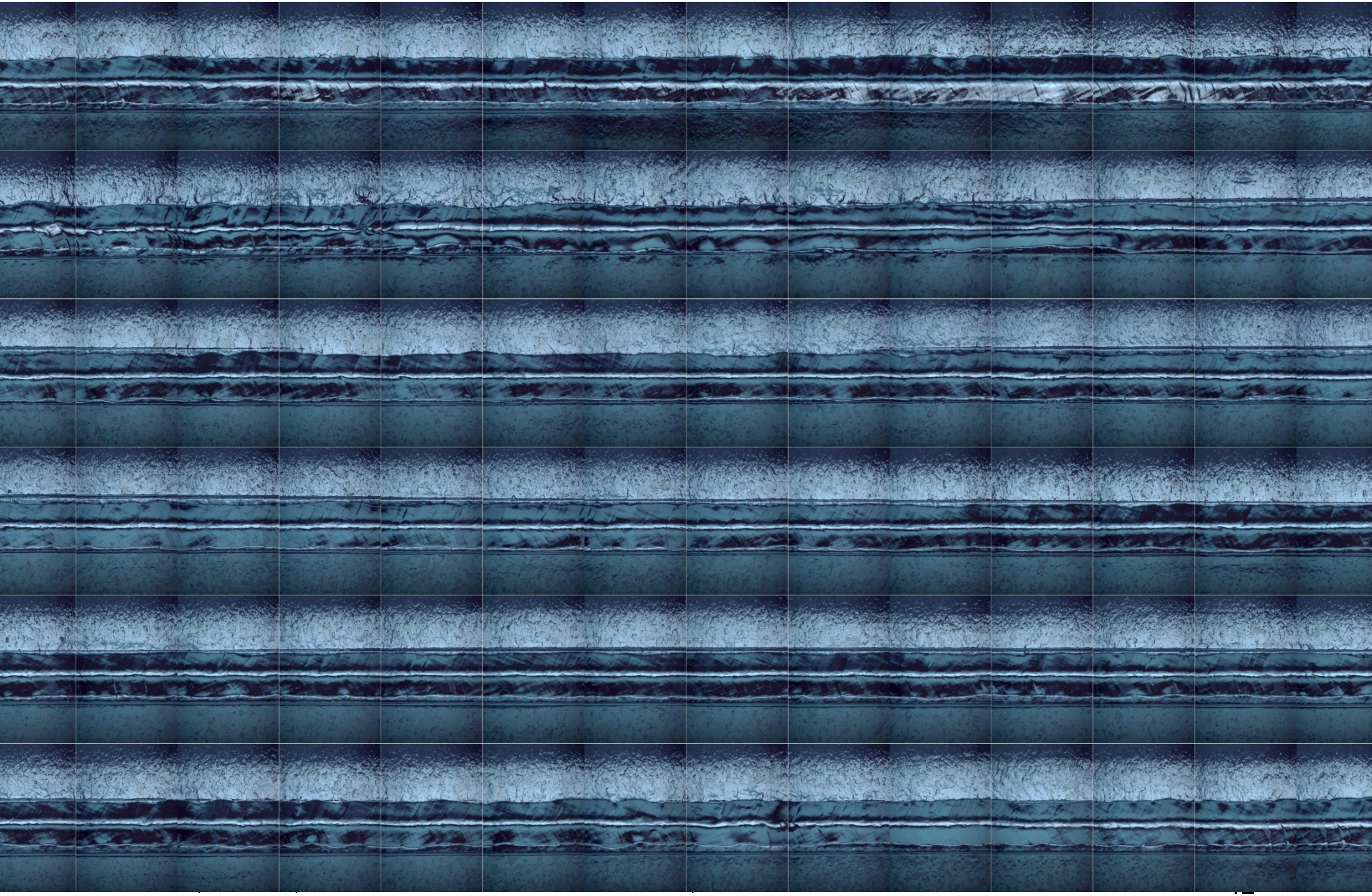




Total number of sensor:176
18 sensors/cell



A typical equator weld-full azimuth collage:

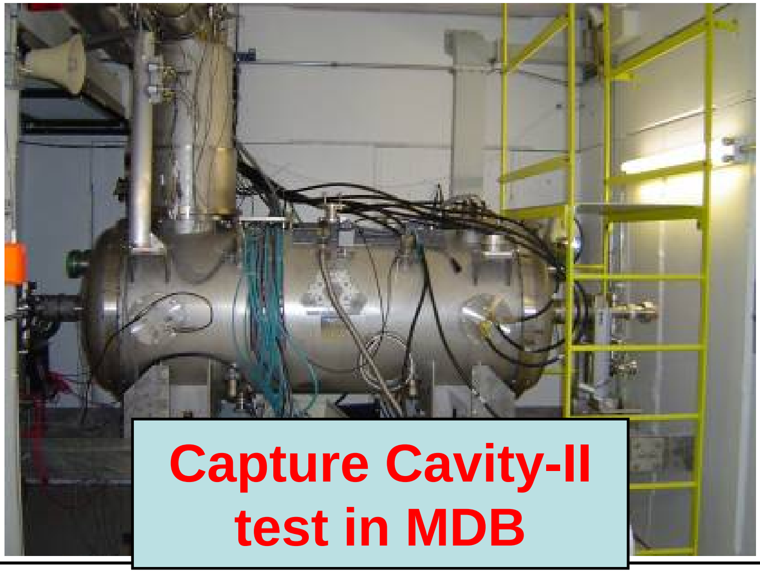


FNAL - MDB Infrastructure


RF Power for HTS


Cryogenics transfer lines in MDB


Large Vacuum Pump for 2K


Capture Cavity-II test in MDB

Cryomodule Assembly Facility

- Goal: Assemble R&D Cryomodules
- Where: MP9 and ICB buildings
  - MP9: 2500 ft^2 clean room, Class 10/100
  - Cavity dressing and string assembly
  - ICB: final cryomodule assembly
- Infrastructure:
  - Clean Rooms, Assembly Fixtures
  - Clean Vacuum, gas, water & Leak Check
- DESY Cryomodule "kit" assembled

FNAL

ICB clean: Final
Assembly fixtures installed

MP9 Clean Room

String Assembly

Cavity string for 1st CM

1st FNAL built Cryomodules

3.9 GHz Cryomodule
Designed/built at FNAL
for DESY

Cavities: path to gradient choice

- **Most 9 cell cavity testing at JLab and Desy**
  - Field emission greatly improved – post-EP rinsing
  - Development and deployment of diagnostics →
  - Welding studies underway
- **Initially, we considered and expected (2007):**
  - Greater, more effective *inter-*dependence
  - More efficient infrastructure commissioning
- **2005 – 2010:**
  - Excellent progress but
  - Fewer tests than anticipated
  - 2010 gradient recommendation based on ~ 60 cavities

Guidance and Advice from TESLA Technology Collaboration (TTC)

Proposal for an R&D Plan towards better Understanding of the Electropolishing of Niobium Cavities

P. Kneisel, K. Saito, D. Reschke
Jan. 17, 2006

Final Surface Preparation for Superconducting Cavities

An attempt to describe an optimized procedure

Reply to the

Request for Consultancy from TTC

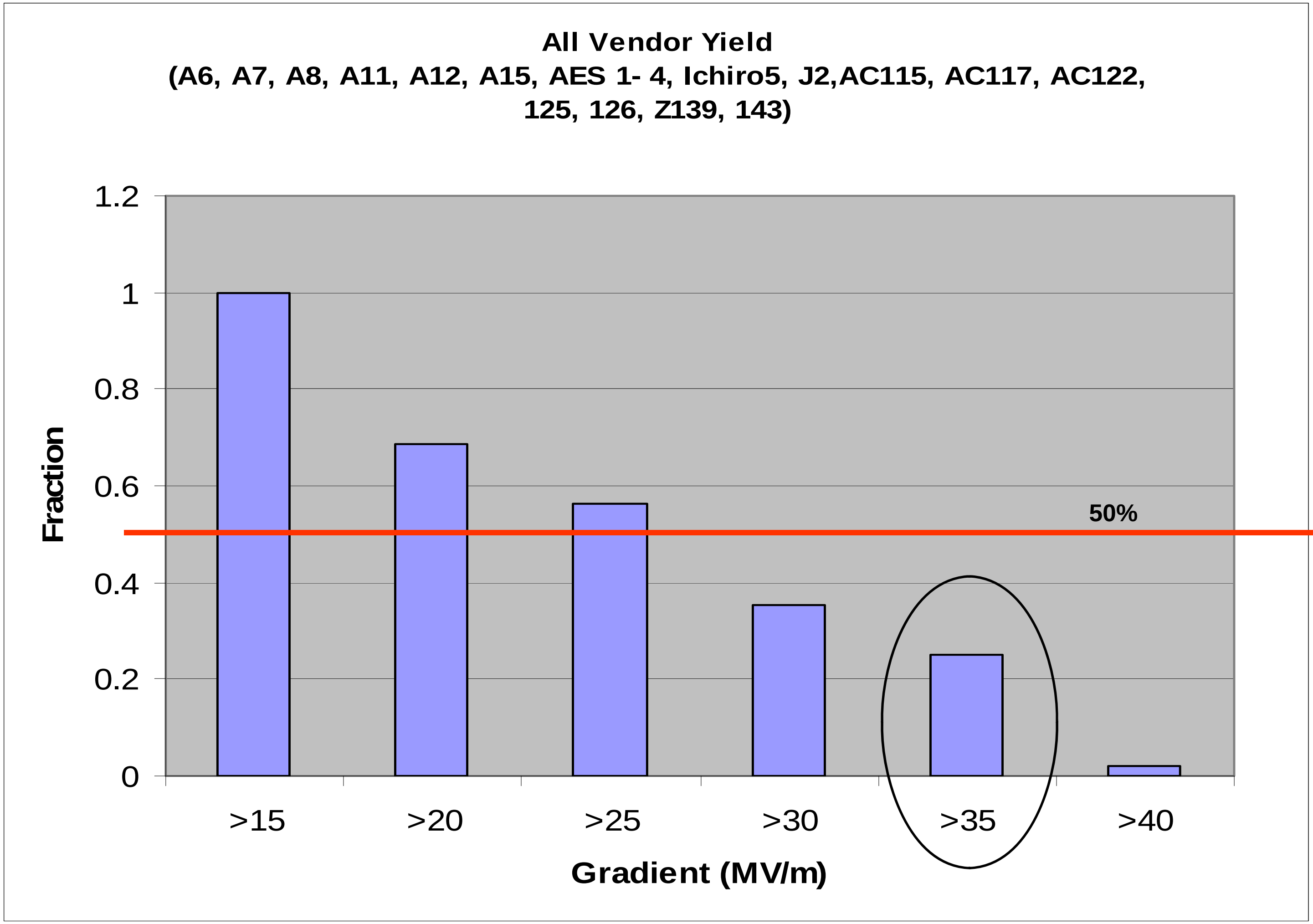
raised by

the ILC R&D Board Task Force on High Gradients (S0/S1)

- TTC: derived from the TESLA Collaboration
  - **Credited with TESLA SRF design**
- Active across a broad set of SCRF topics

Multiple Vendor Cavity Yield

48 Tests, 19 cavities, including ACCEL, AES, Zanon, Ichiro, Jlab



Presented by Hasan Padamsee at November 2008 ILC GDE meeting; TTC: Americas Summary

AAP review / TILC09:

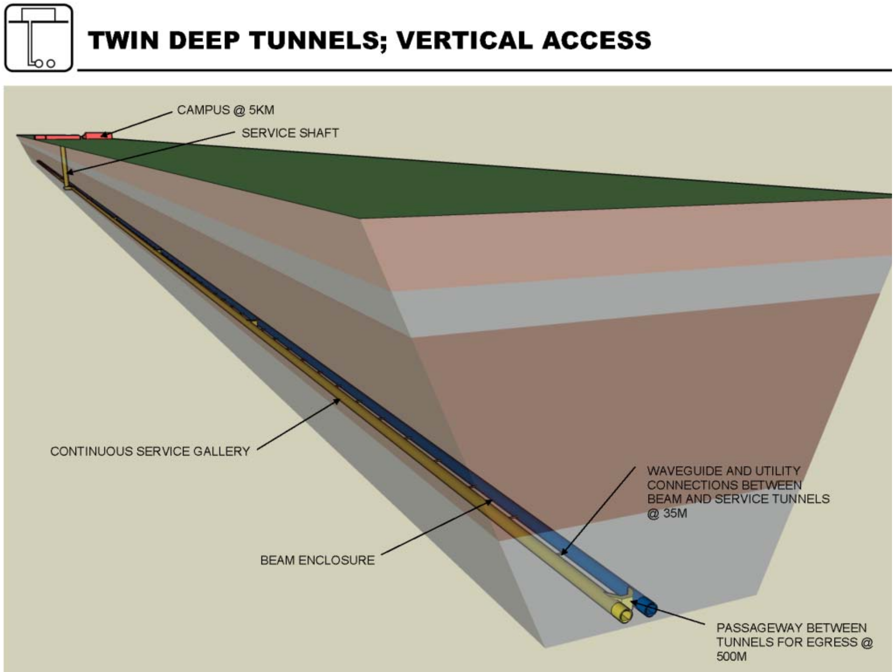
50% yield at ~ 33 MV/m; 39 cavities in 2008/2009

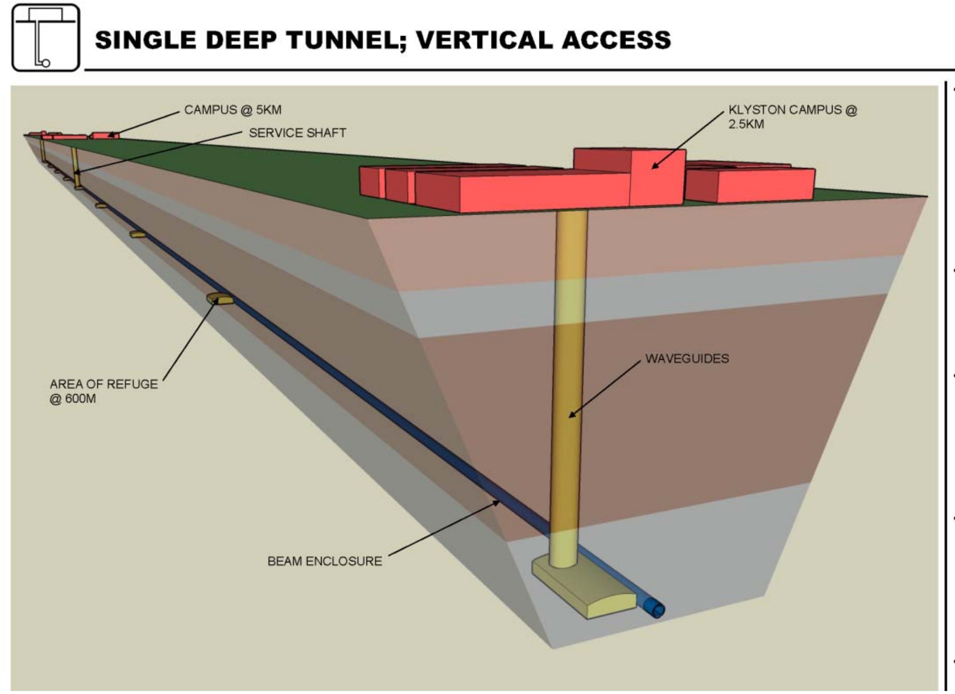
Process yield / Fabrication flaws

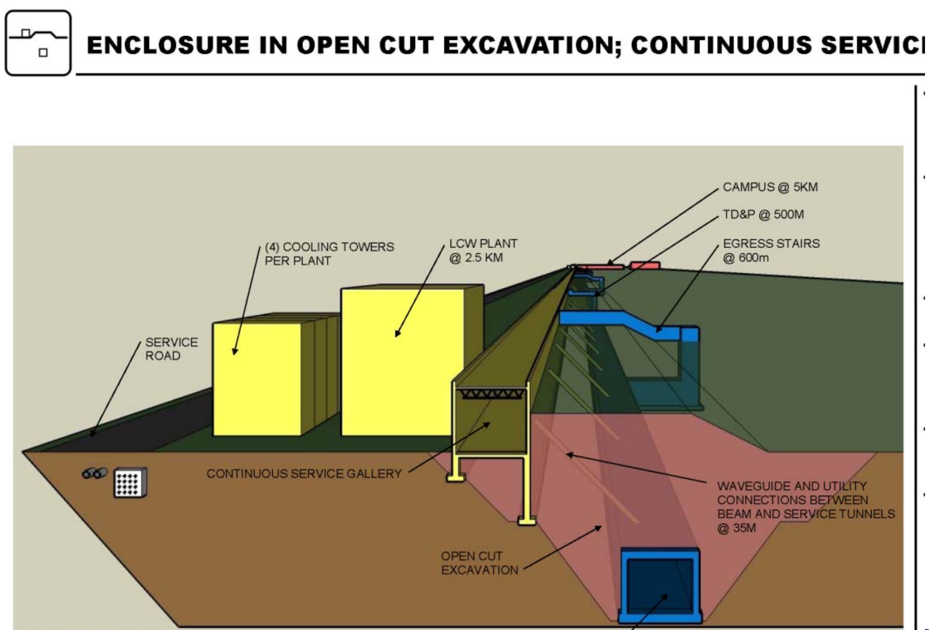
- Process yield:
  - **Studies of post-EP rinses using cathode cover material (teflon mesh)**
    - Ethanol / degreaser / ultrasonic
  - **2007 – 2008 show less than 1/3 have field emission**
    - (from TTC → thoroughly appreciated success!)
- Fabrication flaws:
  - **Weld proximity 'heat-affected' zone surface defects → <20 MV/m limit**
    - Quench locations → weld-related defects
    - Vendor differences significant
  - **Benefit of this yet to come**

4. Conventional Facilities and Siting

- **Purpose of CF / S effort in TDP:**
  - CF (utilities) effort cost driver, schedule driver
    - Can be challenging (e.g. J-Parc, Numi, …)
  - Fundamentally technical and political – more so than any other single project component
    - *Flexibility* should be a consideration in criteria development process
  - Development of *site-specific technical criteria* in order aid preparation of ‘hosting bids’
- **Basic focus of our Accelerator Design and Integration Activity**
  - Iterating CFS design (‘value engineering’)
  - Many aspects of this machine are unusual →
    - e.g. underground utility usage
  - Balance between generic design development and consideration of specific site details







Linac Tunnel configurations – 3 of 7 under study

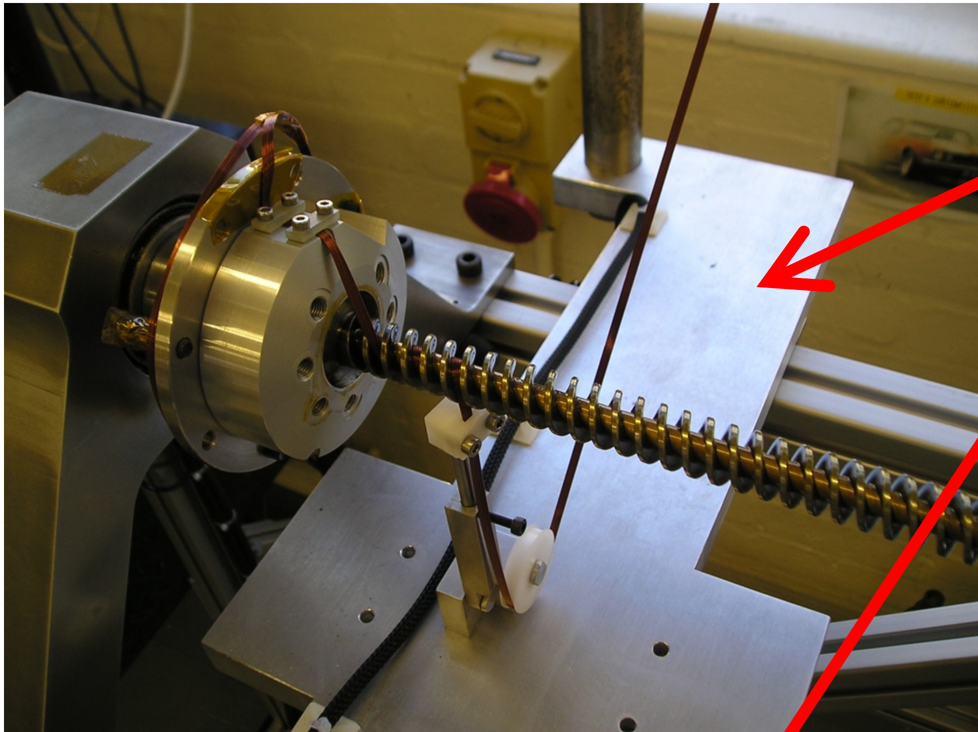
Site Specific vs *Generic* Design

- **Reference Design is based on a generic twin – tunnel topology →**
  - adapted to sample sites - one in each region: Fermilab, CERN, Japan
  - 2007 Value estimate based on *average*
  - Topology-related cost differences between regions ~ small
- **NOT an optimized, site-specific adaptation of Technical systems**
  - Power / water, High level RF distribution, cryogenics → these were *NOT* adapted in Reference Design to suit each of the 3 sample sites
    - A common 'generic' design for the above chosen / costed for RDR

Accelerator Systems

- **not a AAP Review Focus Topic –**
  - cost an issue not the only one
  - technical issues and regional spheres of expertise
- **No showstoppers but …**
  - important topics and tests which have effective overlap with constituent labs programs
  - We expect R & D to succeed
- **Example: Undulator – based Positron system**
  - R & D support reduced substantially in 2008
  - R & D and design reduced from plan
  - Shift in primary sponsor: - US/UK to Japan (KEK)

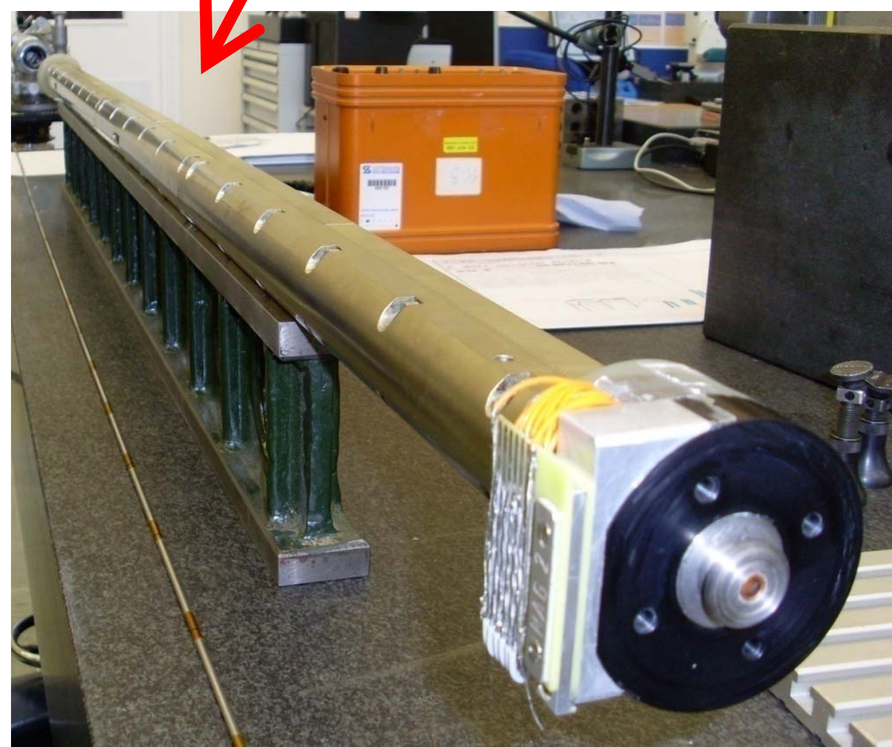
Undulator Fabrication

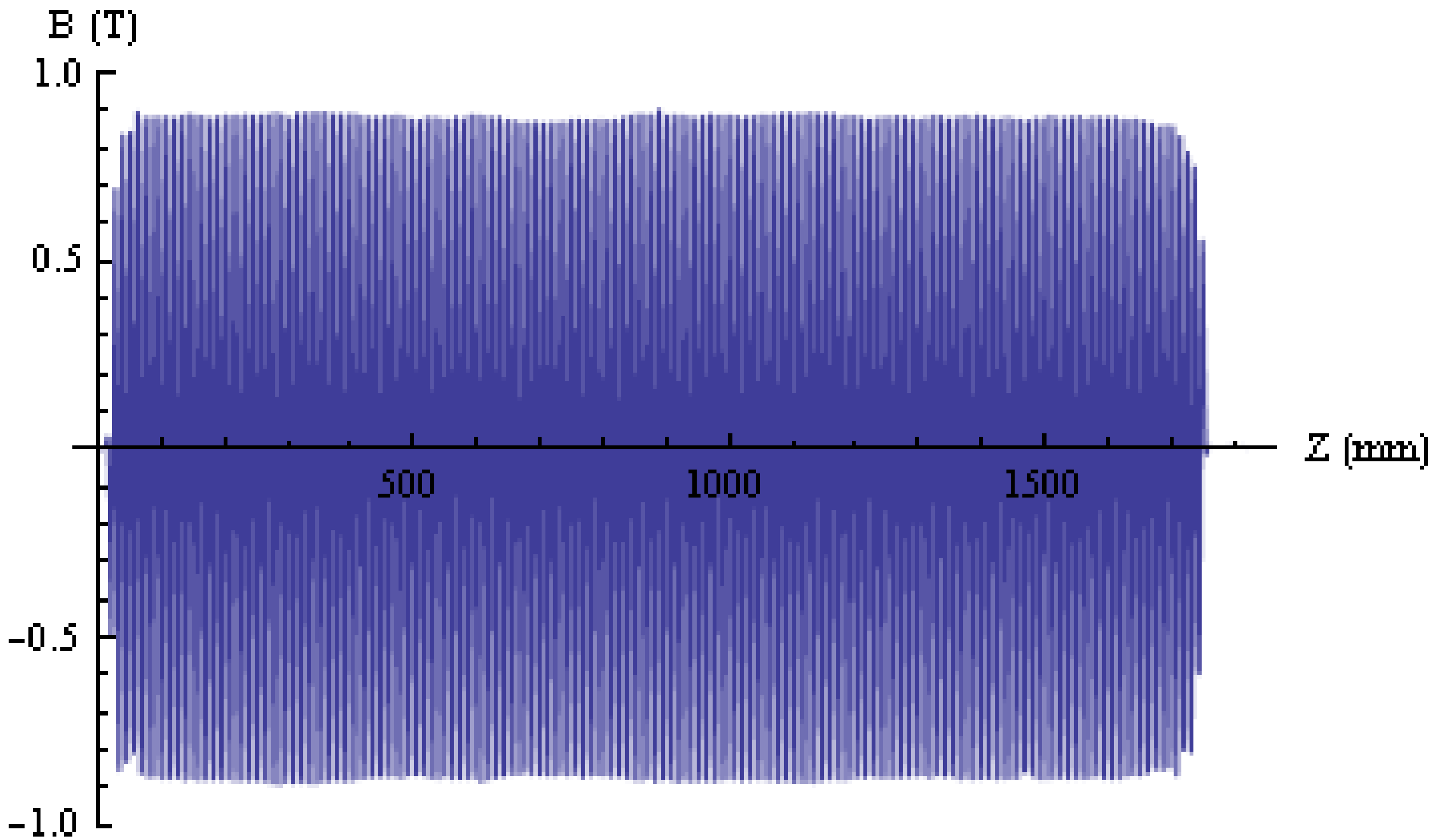


Winding

Potted and in one half of steel yoke

Complete magnet

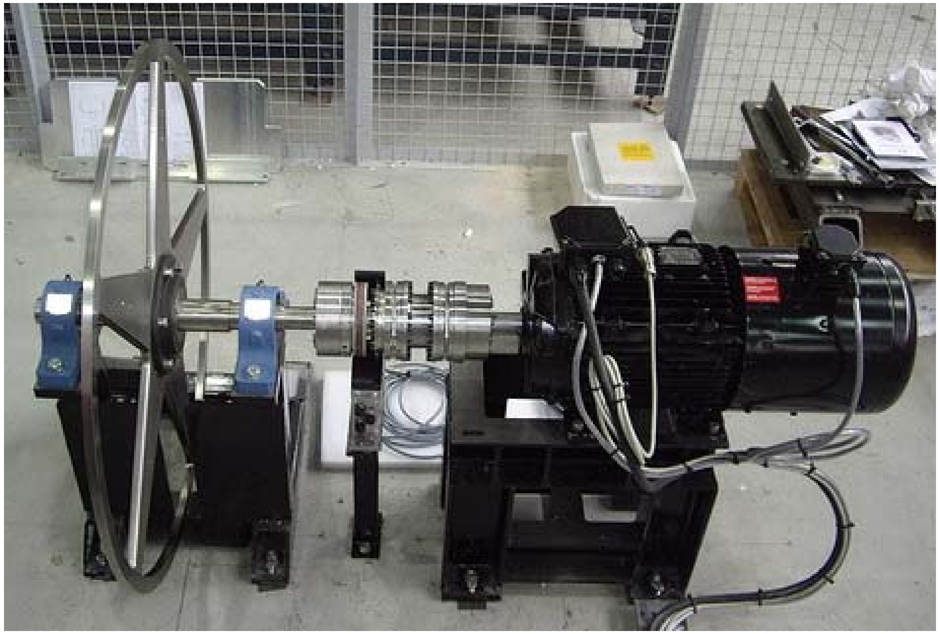


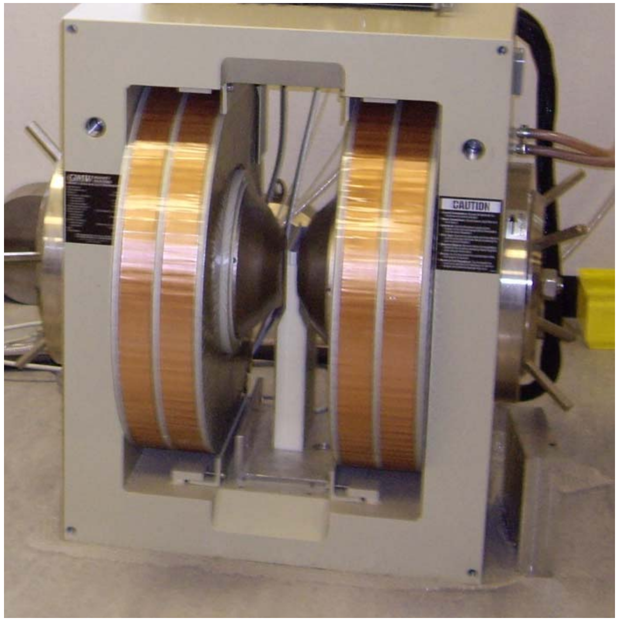


Example fieldmap from Magnet 1 at 215A

RDR field specification is 0.86T

Cockcroft Institute Prototype



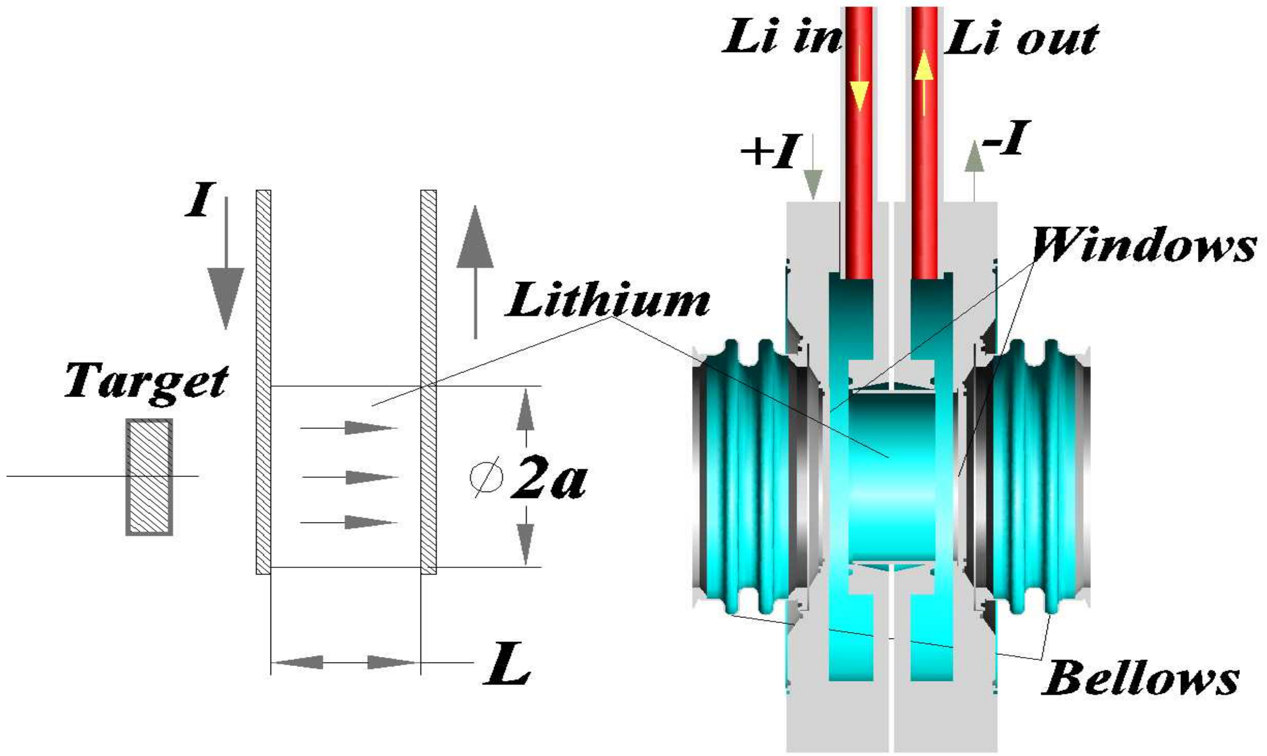


Experiment started

Completed end of 2008

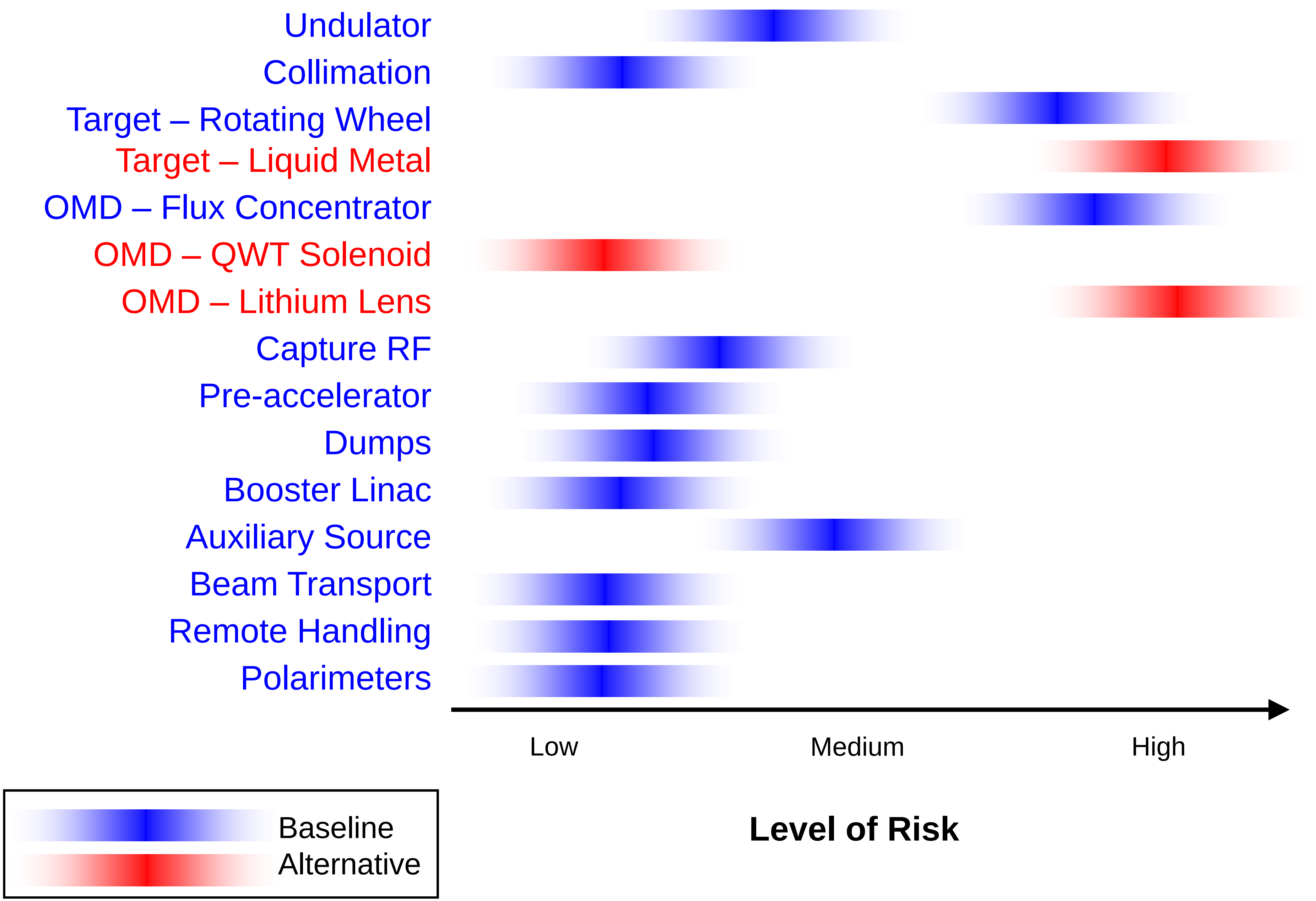
OMD Alternative - Lithium Lens

- Proposed by Cornell
- Current flows co-linearly with positrons
- Induced magnetic field gives focussing
- Lithium will be liquid with flow of ~1m/s
- Capture up to ~40%



A Mikhailichenko, EPAC 08

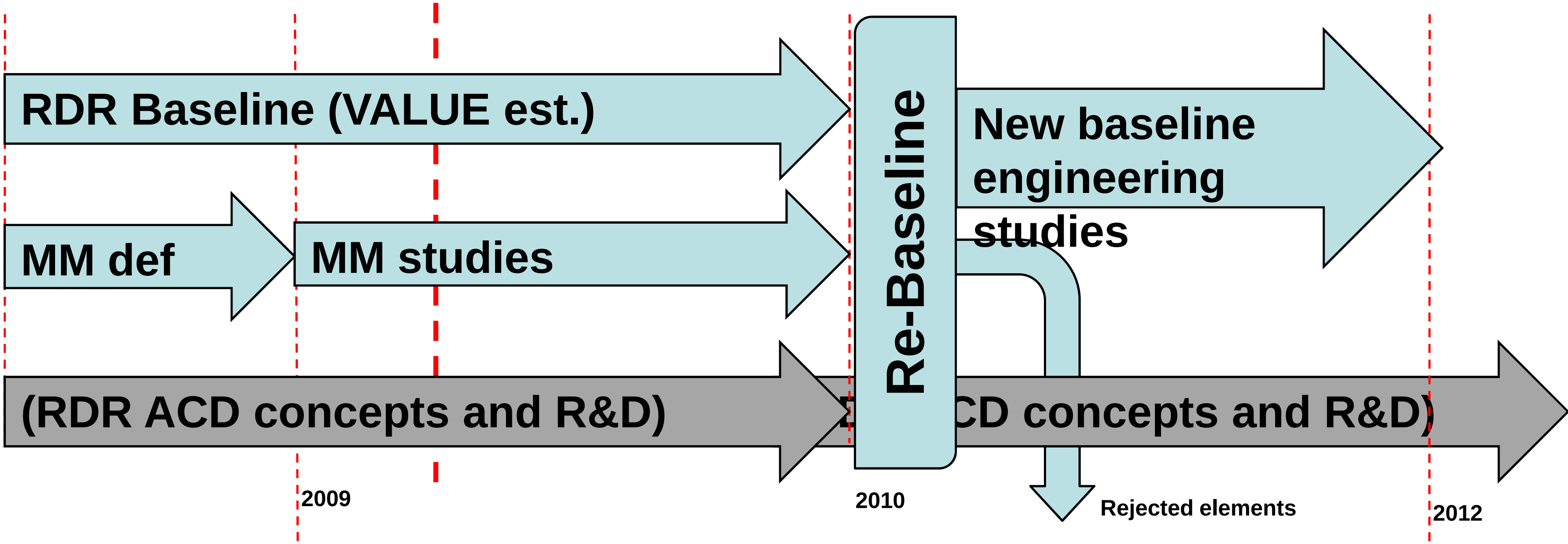
Critical Issue Summary



Accelerator Design and Integration

- **Transition from loosely knit collaboration to project:**
  - Strengthen and sharpen RDR design choices
- **6 topics –**
  - 1) Single linac tunnel, 2) surface klystron cluster, 3) low beam power, 4) central complex optimization, 5) single stage RTML, 6) 1 TeV upgrade path (esp. BDS).
- **'Iterating' the Reference Design**
  - keeping it healthy and working to improve it.
- **"involve the community such that it is prepared to engage "**

Towards a Re-Baselining in 2010

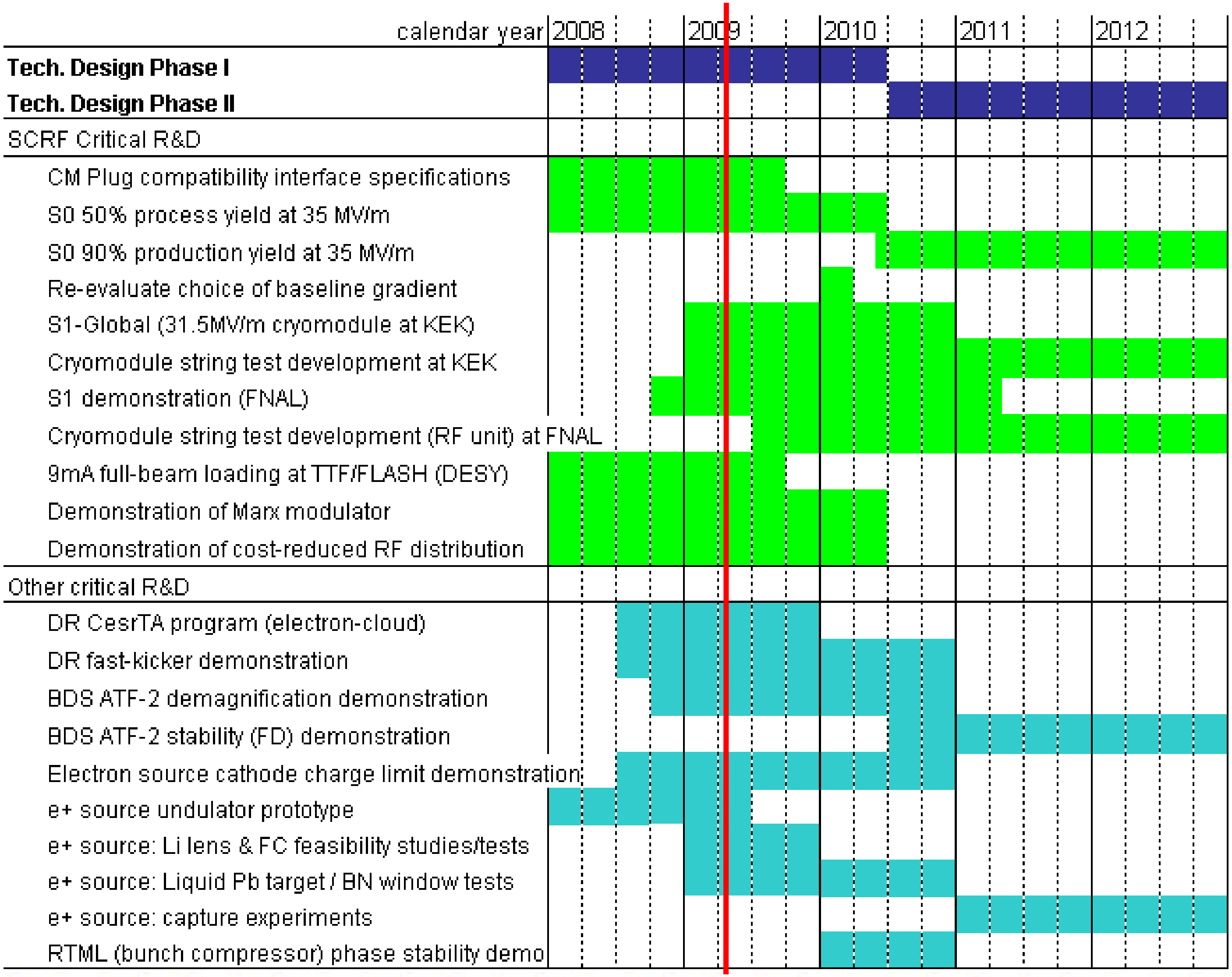


- **Re-baseline exercise will review**
  - Basic parameters (including choice of gradient)
    - Input from on-going critical R&D programmes
  - Machine configuration possibilities
    - Including minimum machine elements - *Design and Integration*
    - And other possibilities where applicable
  - TDP-2 Baseline will be effectively ‘frozen’ for cost and development exercise
    - Leading to TDR
  - R&D on possible promising alternatives will continue in parallel

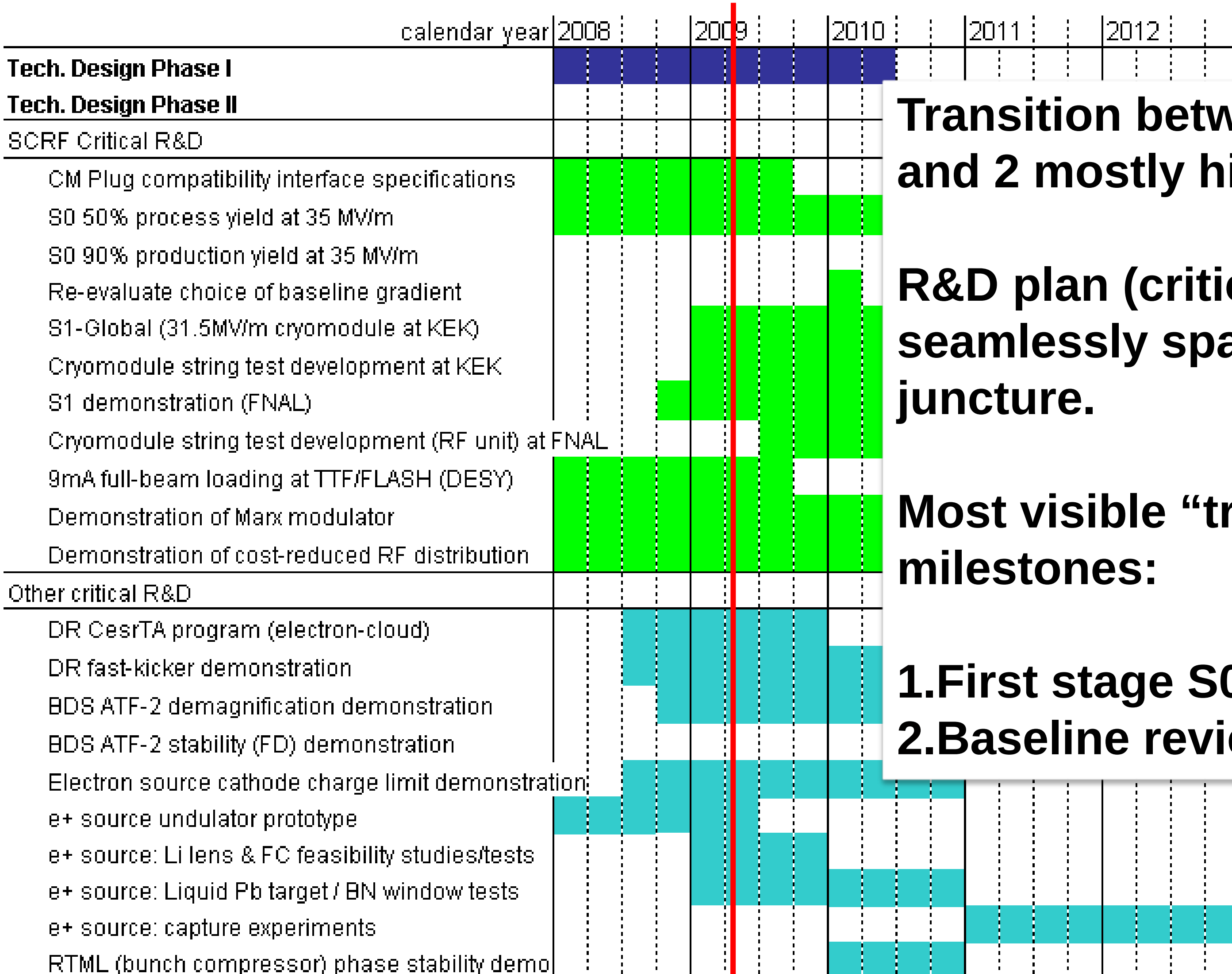
Project Manager's Report:

- **Role of R & D in the Technical Design Phase**
- **The new baseline – updating the Reference Design**
- **Focus Topics, and Accelerator Design and Integration**
- **TDP deliverables**
- **TILC09 and the AAP Review**

TDP R&D Plan Milestones



TDP R&D Plan Milestones



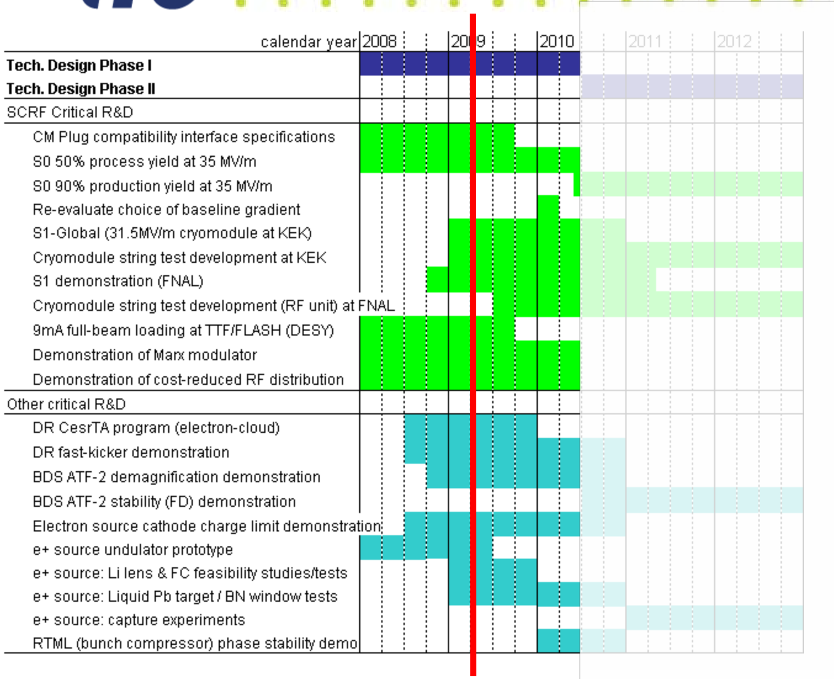
Transition between phase 1 and 2 mostly historical.

R&D plan (critical R&D) seamlessly spans this juncture.

Most visible "transition" milestones:

1. **First stage S0 goals**
2. **Baseline review**

TDP R&D Plan Milestones



* Beam test facilities

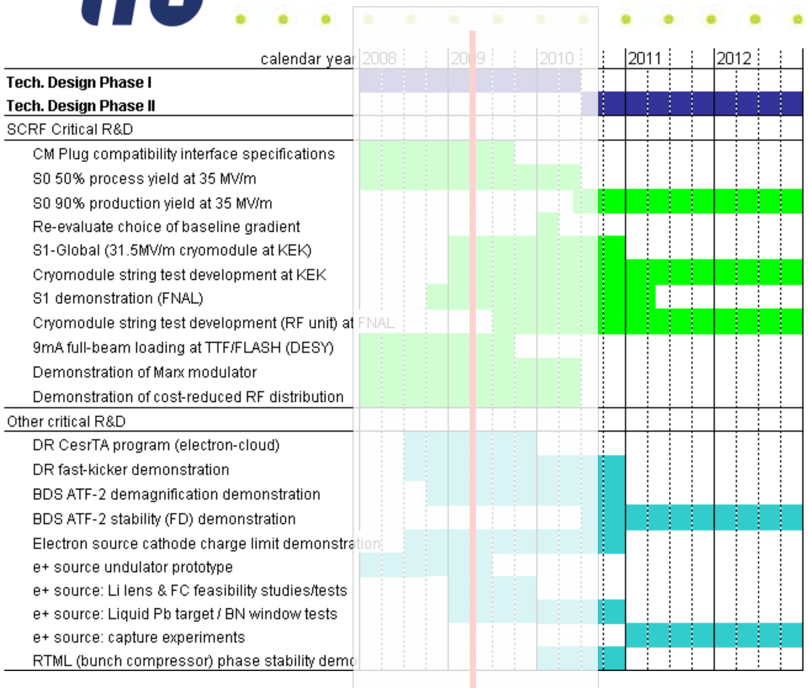
TDP-1 specified high-level milestones (examples)

- **S0 50% process yield**
  - **Will be based on ~30 cavities!**
- **CM interface specification**
  - **"plug compatibility"**
- **9mA full beam loading demo.**
- **CesrTA programme (e-cloud mitigation)**
- **Marx modulator demonstration**
- **RF distribution system demonstration**
  - **"circulator-less"**

- **Positron source SC undulator**
- **Positron source Li lens / FC feasibility studies**
- **…**

- **Baseline review (not shown)**

TDP R&D Plan Milestones



* Beam test facilities

TDP-2 specified high-level milestones (examples)

- **S0 90% production yield**
- **S1-G 31.5 MV/m average cryomodule**
- **FNAL high-performance cryomodule**
- **FNAL string-test**
  - **Marginal within TDP time-frame**
- **STF string-test**
  - **Not within TDP time-frame**

- **Demonstration of ATF2 demagnification**
- **Demonstration of ATF2 beam stabilisation**
- **Demonstration of SC final doublet prototype (ATF2)**
- **Demonstration of 2pm DR emittance (ATF)**

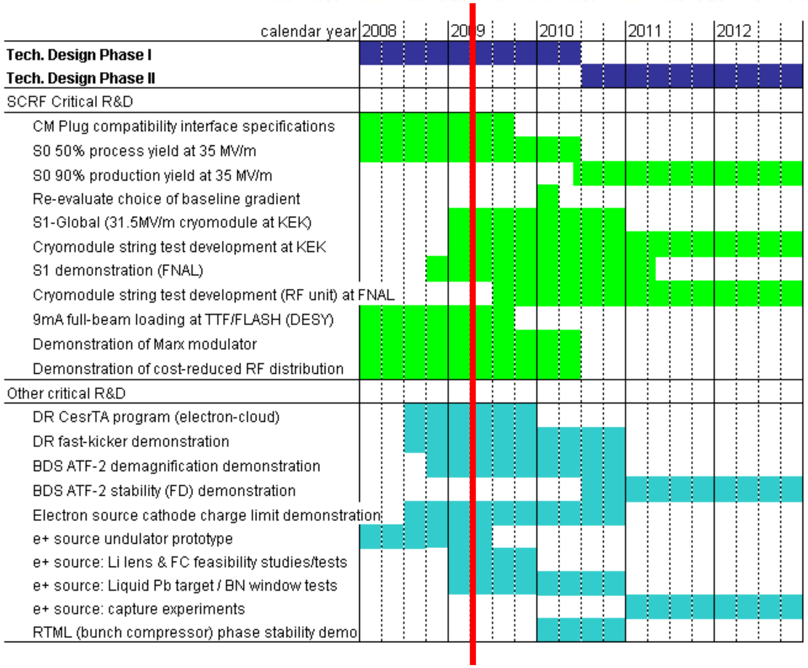
- **Li Pb target demonstration; BN window**

- **TDR design & cost work (incl. PIP).**

Also should not ignore direct synergy with parallel (related) projects:

- **European XFEL**
- **Project-X**
- **…**

TDP R&D Plan Update



- **Will continue to update R&D plan with more detail**
  - **Every six-months**
- **Will continue to look for options to help with identified under-resourced areas:**
  - **e.g. positron source**
- **Look for opportunities to extend programmes at BTF**
  - **Further work at TTF/FLASH**
  - **CesrTA**
  - **…**

Challenge: Resources

- **Dual nature of our task:**
  - Ready for '2012' as indicated to (and accepted by) FALC / ILCSC
  - Develop alternatives because time scale is unknown
- **Base for technical R & D is strong and growing**
  - well aligned with lab activities
    - Lab priorities / project priorities important – but not critical
  - Facilitated in part through 'plug – compatibility'
- ***Base for project specific design work requires coordinated planning and excellent communication – funding agencies / labs / project***
- **Balancing the above is our greatest challenge**

Project Manager's Report:

- **Role of R & D in the Technical Design Phase**
- **The new baseline – updating the Reference Design**
- **Focus Topics, and Accelerator Design and Integration**
- **TDP deliverables**
- **TILC09 and the AAP Review**

TILC09

- **includes a full set of parallel sessions in addition to the review**
  - Complicates scheduling and constrains speakers / conveners somewhat
  - Will make every effort to support Q / A sessions – but please be patient
  - Parallel session / AAP review break schedule should overlap
- **PM priority is to support AAP review activity**
- **Parallel session focus:**
  - **start rebaselining process**

AAP TDP 1 Interim Review – 2009

- **Director's in-depth, 3 ½ day review of technical, managerial and strategic issues concerning the Technical Design Phase of ILC**
- ***First such review of ILC***
- ***Unique project / unique international process***
- **On behalf of ILC GDE / Project Management Team:**
- **Thank you!!**