



S2 Task Force Status (String test definition)

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Overview

- Task force set up by the Global R&D board
 - **What are the reasons and goals of a system test? Start with TRC R2 list.**
 - **Determine how many RF units are needed as a system test before ILC construction**
 - **Do they need to be in a string?**
 - **Is beam needed?**
- Charge has been viewed, but not yet approved by the EC
- Just getting started on the work



Charge

The conceptual plan for the R&D for the ILC includes the building and testing of a string of cryomodules after the proof of principle milestone of reliable production of cavities and single cryomodules has been achieved. As the basic building block of the linac, the minimal string is one RF Unit containing three cryomodules with full RF power controlled substantially as in the final linac. The desired string for the ILC R&D plan may consist of many RF units. The definition of the details of this milestone, which we call S2, needs to be defined by GDE, along with a timeline for its realization.

Some of the crucial specifications of the string have been defined in the R2 ranking of the R&D issues in the TRC report (2003). More specifications may be necessary. The full scope and goals should be well-established and accepted soon, since they will constitute an important milestone on the road to final construction approval. The R&D Board is asked to set up a Task Force to propose a Plan with a set of goals and specifications and a time

scale for accomplishing them, which will be submitted to the GDE for action.

Examples of the parameters to be determined are the number of modules needed in the string, the performance specifications, the nature and duration of the tests, the rules for the deviations from the final production specifications and final environmental conditions. The Task Force should take care that the whole project is as well-defined as possible, interacting with the Area communities involved.

Without

anticipating the result of the Task Force analysis of the number of modules required, it is likely to be large enough so that industrialization is required to render their production practical. The Plan should contain the practical information to show how the transitions from proof-of-principle to the S2 Milestone and start of main linac production should be accomplished.

There is no GDE specification dealing with a Test Linac, and the Task Force proposal should address the question of whether there should be a Test Linac, and with what parameters.

Such a linac would imply the injection of a beam into the string defined in S2. The Task Force should establish the relationships between the functions of the string, the operation of the string in realistic conditions, and the use of a Test Linac as a facility for beam measurements.



Members

- Hasan Padamsee (Co-Chair)
- Tom Himel (Co-Chair)
- Bob Kephart
- Hitoshi Hayano
- Nobu Toge
- Hans Weise
- Consultants: Sergei Nagaitsev, Nikolai Solyak, Lutz Lilje, Marc Ross, Daniel Schulte



Process

- The task force's work will be open.
- Comments are welcome from people who choose to follow our work. Just remember that everything is a draft or preliminary as it will be a work in progress.
- Wiki page available off the linearcollider.org website via the Global R&D board wiki or at: http://www.linearcollider.org/wiki/doku.php?id=rdb:rdb_external:rdb_s2_home
- Email list and email archive are available via the wiki.



Planned Process

- Plan to proceed on 3 paths:
 1. **What are the goals that require a system test? How many RF units are needed? Will these be satisfied by the presently planned productions?**
 2. **What is the scale of the industrial effort and how will this provide a smooth transition to the start of main linac construction? Do the modules produce in this effort need a system test or does it produce so many RF units that we may as well use them in a system test?**
 3. **What tests require beam and how long a linac would be needed for those tests?**
- Then compare results and make an overall plan



Process: 1. Goals and production plans

- Review TRC R2 goals and revise them
- See what tests/ test facilities are presently planned FLASH (TTF-II), SMTF (ILCTA@FNAL), XFEL and STF
- Determine total amount of equipment planned or existing



Process: 2. Industrialization needs

- Look at how previous high tech projects have been industrialized
- Make cavity/cryomodule industrialization plan(s)
- Count how many cryomodules we may have as a function of time.



Process: 3. Beam tests?

- Calculate number of RF units needed for various system beam tests
 - **Emittance growth**
 - **Vibration problems**
 - ...



Status

- We have a fairly detailed work plan
- Tasks have been distributed to taskforce members
- Work has started on all 3 parts of our process
- Our first group discussion of the this work was yesterday



Discussed Yesterday

- Kubo: length needed for beam test of emittance growth and vibration measurement
- Nagaitsev: Fermilab ideas for ILC test linac
- Toge: Reliability evaluation and comments
- Himel: previous industrialization efforts
- Kephart: An ILC industrialization plan
- Padamsee: Update on timelines for TTF, STF and SMTF
- All: Update R2 list of reasons for a system test

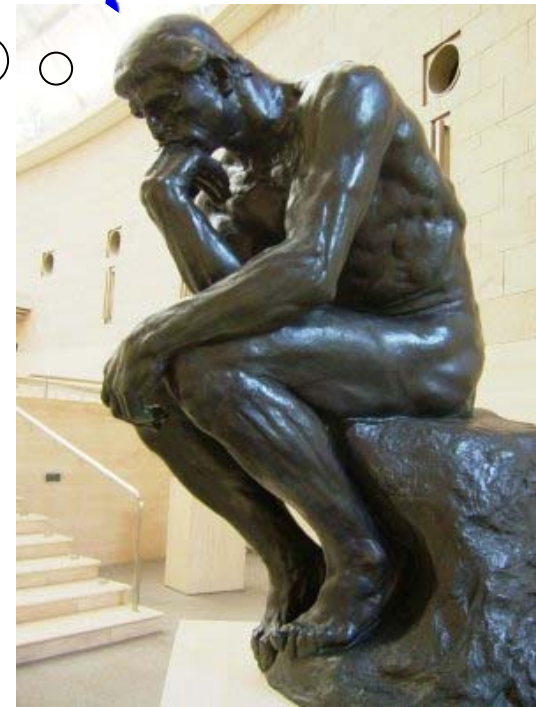
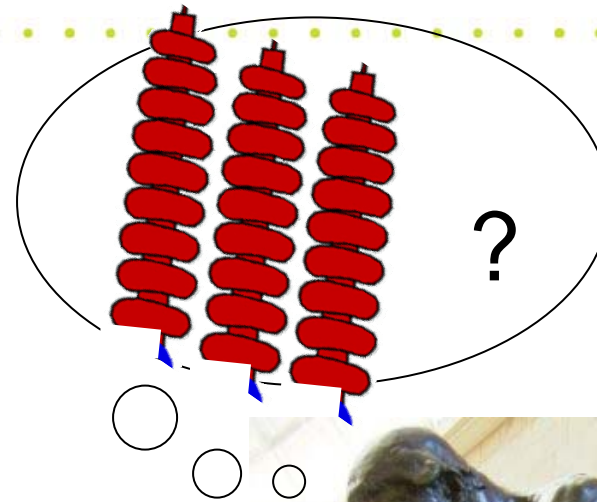
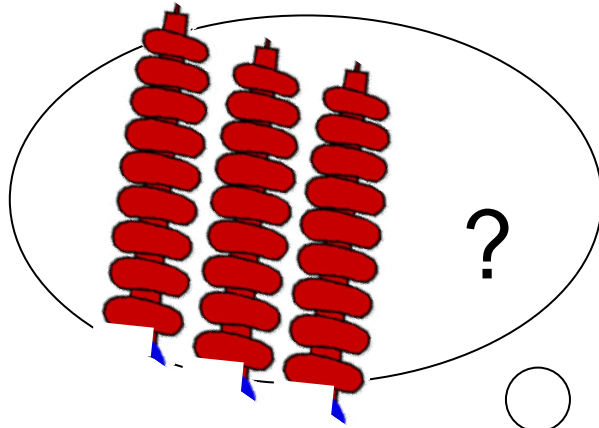


Decision Making

- Consider all information gathered with the above process
- Consider that too small a test could cause a high risk of problems when the ILC is built
- Consider that too large a test could cause significant schedule delays
- By some process, make a sage decision by the end of this year.



Decision Making Method



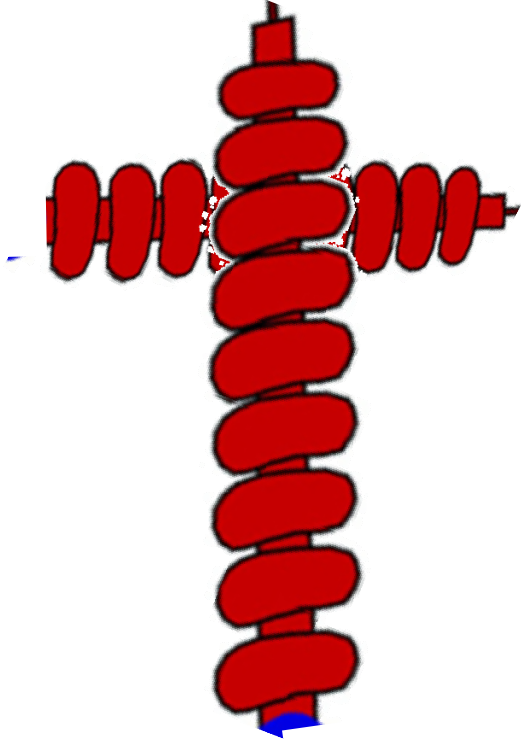


Decision Making Method





Decision Making Method





Decision Making Method

