Director's Corner

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Akira Yamamoto

A plug-compatible approach toward a truly efficient international collaboration

Today's issue features a Director's Corner from Akira Yamamoto, Project Manager for the Global Design Effort.

It has been eight months since I joined the ILC team as a project manager. I have been learning a lot and am impressed with research and development works achieved and with the knowledge and expertise each scientist or engineer has. I have got the glowing feeling that we should keep encouraging the scientists' and engineers' creative motivation during our technical design phase in progress.


A plug-compatible string of flags. (Image credit: usflags)

The GDE has been planning to down-select various ideas to a single design reasonably soon, to make the future R&D and further efforts efficient and cost-effective. A question that occurs to me is "will it be really wise?" The scientists and engineers are motivated by the spirit to challenge unknown and unprecedented achievements. If they have to work for something already well defined and decided, it could be very hard to maintain their high motivation and efficiency. It could even affect their will to continue the creative work. It might be wise to pursue our goal with keeping flexibility and competitiveness among different technical approaches by giving the ILC scientists and engineers a certain level of freedom. One way to make this challenge possible will be the "plug compatible" concept. It may allow flexible and more intelligent ideas in components with common and well agreed functions and interface conditions. In my mind, it is very important for them to keep their creative spirit. It is also very important that the intellectual work and the knowledge should be well shared globally.

I would try to think about the plug-compatible concept to be just like a string of international flags. We need to have a rope to connect each flag with the next one. The rope and its knot are the plug-compatible interface to connect the different flags from various countries.

I think the plug-compatible concept worked well for the project of which I have been in charge: superconducting magnets for the beam interaction region at the LHC at CERN. Fermilab and KEK cooperated and shared responsibilities to develop a superconducting magnet with identical functioning and with two very different engineering designs originated from each laboratory based on each lab's expertise and constraints. The LHC will soon give us an answer when the series of magnets will be commissioned. It would be an example to make sure that the plug-compatible concept works well.

The plug-compatible concept also allows us to have several back-up plans to deal with unexpected situations. We should prepare for the risk to concentrate on a single technical approach, and should leave multiple solutions. What the ILC community needs to do now is how to achieve agreements for plug-compatible boundary conditions for interfaces between components to be developed. It may give us much more time to concentrate on technical work based on individual knowledge and experience. It will be important to bring the successful performance with the plug-compatible component.

If it works well for the SCRF cavity development according to all three regional efforts, we may plan to demonstrate a system engineering test with those cavities assembled together in one cryomodule, and it may be called the "S1-global", referring the technical term "S1" defined in the R&D plan in the reference design phase. To me, it is a good starting point to bind the string of flags mentioned above and replace it with cavities, and it will be a real demonstration on the international cooperation in the ILC.

I believe that we need to show our project's technical feasibility and credibility by achieving visible milestones step by step. The idea we project managers are proposing to our colleagues is to pursue the S1-global to process utilising an available facility with cavities contributed from Europe, United States, and Asia to be systematically tested together. It would be a great opportunity to demonstrate our ability as an international collaboration.

It will be a long road to realise the ILC, and technology will keep advancing along the way. We are now at the starting point to demonstrate our ability to pursue our truly efficient international project.

-- *Akira Yamamoto*