AFTER project - 07/12/2011

Technical resources actions

The AFTER project proposes to produce a <u>technical study feasibility</u> of the experiment proposal. Therefore a team will be created in order to provide all the skills, resources and tools to accomplish this task.

The question today is to know <u>how to start the process</u>. The tasks can be split in <u>3</u> <u>phases</u>.

In the phase 1, it is preferable to <u>start by a small multi-skills group</u> during the first year in order to draw the contours of the technical project and associated constraints. While the first <u>simulation</u> results can be available, we could use this data as input parameters and perform a <u>problem analysis</u> inside this working group. The goal will be to write a **"cahier des charges"** giving the limits of the project. A review will be organized to validate the contents of this report to launch the second phase of the project.

This second step is dedicated to the following of the physicists simulations and the starting point for some <u>technical R&D</u> on specific points that can be discussed in additional working groups. We foresee to <u>strongly iterate between technical studies</u> <u>and physicists simulations</u>. At that time, it is possible to <u>reinforce the simulation</u> task with mechanics, electronics or else ones, in order to assess the behavior of the setup. The idea is to get enough input for the technical survey. The result of this phase is the listing of the possible elements with an associated <u>risk analysis</u>. A second review will status on this job performed during the year n+1. It will propose reinforcement on critical points and/or validate some concepts that then can be detailed in design.

During the third phase foreseen on year n+2 and n+3, the <u>writing of the conceptual</u> <u>design report</u> must start and be accomplished. Some study engineer reinforcement must be allocated during this period in order to <u>precise the technical definition</u> of the experiment and to <u>contact industrial</u> to budget more deeply the elements. This will also help to perform a more reliable risk analysis and budget/resources plans. The first draft of the conceptual design report will be submitted to reviewers 3 months before the end of year n+2 in order to assess the critical points advancement. The final review must happen 6 months before the end of the ANR contract in order to fix last problems after review recommendations.

Task	γe	ar n	0000000	year	n+1		year n+2		year r	1+3	
Physicists simulations											
Pb Analyse											
CdC writing			6								
Technical simulations			Ø								
Preliminary elements listing						0					
Technical R&D design studies)					
Conceptual design report writing									- W		
									0		
: review											

System integration task

In the framework of the AFTER project, the task "system integration" is really interesting for the success of the project. An upstream R&D about the association of all the set-up will help the good interfacing and design of the detectors. First of all, it can help the R&D of each detectors as it gives some overall input parameters necessary for their individual designs and on the second hand, it draws the frame for the link with the beam and with the environment like the hall where could sit the experiment. At the end, it will consist in the assembly drawing of all the concepts in respect with the physicists requirements.

Based on our previous experience in the ALICE or PANDA experiment, IPNO partner got the skills to take in charge this job. We had in the past to propose ideas and concept to integrate our systems, it is to say, the detectors and all associated services like cooling and electronics read-out. We validated this by simply building and installing it in the real experiment. Today, our implication in several collaborations allows us to be informed about most interesting R&D in the world. By this way we can keep on a technological survey necessary for the AFTER project.

The resources dedicated for this task is about 9 man.months for 3 years. The foreseen activities are: participation in the different detectors reviews, keep an updated data base as a list of elements, check the interfacing with help of a CAD system, and participate in the validation of solutions with the management board.

The risk about this task is linked to the difficulty to get realistic data in the allocated time from the R&D of the individual detectors and corresponding subgroups as the concepts may need several years to find the needed innovation. The solution would be to actively participate to any subgroups in order to propose derived solutions. Finally it may be possible to define a minimum concept usable to create a reliable and realistic proposal.

