



The n_TOF Collaboration Board

Memo to the INTC

17 May 2006

Object: request of beam-time for n_TOF for testing and for physics in 2006

During the last period of measurements performed at n_TOF (August to November 2004), an increase in the activity of the cooling circuit has been detected by the RP monitoring system (see Figure 1 and [1]).

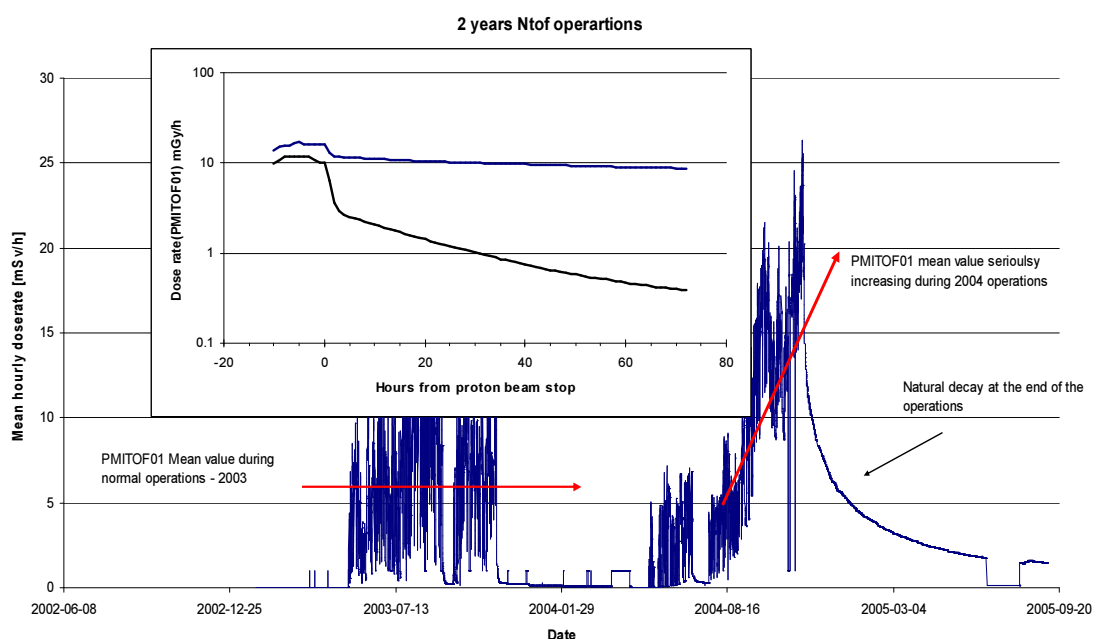


Figure 1: cooling circuit activation monitoring in 2004 and in the previous two years of n_TOF operation. Source: CERN-SC-2005-034-RP-TN.

This observation prompted the RP to request an assessment of the radiation protection conditions for operation of the n_TOF facility. As follow-up, several actions have been undertaken by the CERN AB/ATB group following the SC/RP indications to establish the cause for the increased activity and, at the same time, to propose solutions for its settlement. Amongst these, the “filter” operating on the cooling circuit has been replaced and the change in the activity released monitored.

The outcome of these actions can be briefly summarized as follows (more details are available on the n_TOF website [2]):

1. There is NO significant amount of Pb in the water (almost $\times 1000$ less than required by the simulation to explain the presence of spallation products). All the measurements of Pb concentration on the cooling water have proved to be negative or not significant.



2. The filter of the cooling circuit has been replaced after the shutdown. Since then, the PMI monitor activity has decreased by a factor of 100. It is now slightly increasing again.
3. The filter can now be replaced more quickly ("plug-in") with reasonable dose to personnel and it can be disposed of properly

Together with the actions related to the measurements of the activity, an initiative which will lead to the design and realization of a new n_{TOF} target has been launched jointly by the CERN AB/ATB group and supported by the n_{TOF} Collaboration. The design options are expected to fulfil the requests put forward by the SC/RP [3]. This activity is presently going on and a report on its status will be presented at the next meeting of the INTC, on May 22-23, 2006.

In November 2004, the last measurements of the first phase of the n_{TOF} experiments ended. Since then, the n_{TOF} Collaboration has submitted to the INTC a general proposal for a "Phase-2" of activities to be performed at n_{TOF} [4], and three *detailed proposals* for specific measurements [5][6][7]. All these proposals have been endorsed by the INTC and positively evaluated by the CERN Research Board (see CERN-INTC-2005-035 on the NuPAC workshop, and the minutes of the twenty-fifth meeting of the INTC held on Monday 20 and Tuesday 21 February 2006).

As a consequence of the present situation, the n_{TOF} Collaboration Board has decided to ask the INTC to consider the possibility of **allocating beam time for n_{TOF} during the 2006 PS operation**. This request will fulfil multiple purposes:

- provide the possibility to confirm the increase of the activity in the cooling circuit, even with an efficiently operating filter
- provide the basic information required for a safe and optimal design for the new n_{TOF} target
- provide the possibility for performing at least part of the physics program which the n_{TOF} Collaboration is committed to perform within the framework of the Phase-2

The n_{TOF} Collaboration Board is therefore requesting the INTC committee to positively consider this request and endorse it through the CERN Research Board for approval.


For the n_{TOF} Collaboration Board
A Mengoni - Chairman

References

- [1] *Contamination of the Cooling Water Circuit of the n_{TOF} Spallation Target*
T Otto, CERN-SC-2005-034-RP-TN, April 2005.
- [2] *n_{TOF} website – Technical Board Meetings 2006*
www.cern.ch/ntof
- [3] *Radiation Protection Issues for running the n_{TOF} Facility*
T Otto, CERN-SC-2004-033-RP-IR. August 2005.
- [4] *The physics case and the related proposal for measurements at CERN Neutron Time-of-Flight facility n_{TOF} for the period 2006-2010 (The n_{TOF} Phase-2 initiative)*
A Mengoni, F Käppeler, E Gonzalez, *et al.* (The n_{TOF} Collaboration), CERN-INTC-2005-021. INTC-P-197. April 2005.
- [5] *Proposed study of the neutron-neutron interaction at the CERN n_{TOF} facility*
PA Assimakopoulos *et al.* (The n_{TOF} Collaboration). CERN-INTC-2006-006. INTC-P-204. January 2006.
- [6] *Angular distributions in the neutron-induced fission of actinides*
L Tassan-Got, *et al.* (The n_{TOF} Collaboration). CERN-INTC-2006-016/INTC-P-209. January 2006.
- [7] *The role of Fe and Ni for s-process nucleosynthesis in the early Universe and for innovative nuclear technologies*
JL Tain, *et al.* (The n_{TOF} Collaboration). CERN-INTC-2006-012/P208. January 2006.