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MEMORANDUM

To: A. Fabich, AB-ATB

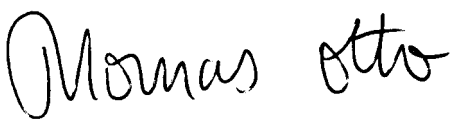
cc: Ch. Hill, RSO AB, P. Cennini, DSO AB, P. Carbonez, SC-RP

From: Th. Otto, M. Silari, SC-RP

Conc.: Release of N_2 from nTOF 11

The experiment nTOF 11 envisages to irradiate a mercury jet target in a liquid nitrogen cooled solenoid with 100 pulses of protons from the PS. The liquid nitrogen in the cryostat will be activated during the irradiation, evaporated and released to the environment.
Via this pathway, a total release from the experiment of 37 GBq of short-lived beta-emitters (^{11}C, ^{13}N...) shall not be exceeded. This figure presents 1% of the emissions from the operation of other accelerators and experiments on the Meyrin site.
The activation of liquid nitrogen in the cryostat by the proton pulse has been estimated by a Monte-Carlo calculation. After a waiting time of 60 s after the proton pulse, an activity of 33 MBq/l would be released to the environment. Longer waiting times would further reduce this figure.
The baseline scenario of nTOF 11 foresees to drain the cryostat from liquid nitrogen before the proton pulse. A residual of not more than 1 litre of N_2 would remain in the cryostat. In this scenario, a total of 3.3 GBq of short-lived beta-emitters would be released during the 100 proton pulses. The baseline scenario is feasible from the viewpoint of radioactive releases.
An alternative scenario, where 120 litres of N_2 remain in the cryostat before the proton pulse, are activated and released, is not compatible with the ceiling on releases.

One modification is required to the baseline scenario: the activated N_2 gas shall be released via a filtered and monitored stack, either by the n-TOF target area ventilation, or, if this is unavailable at the time of the experiment, via transfer tunnel TT10.



Th. Otto, M. Silari