

# Radiation issues for Detectors



# Radiation Rules at KEK

- Normal operation
  - 0.2  $\mu\text{Sv/h}$  for Non-designated area (K1)
  - 1.5  $\mu\text{Sv/h}$  for Supervised area (K2) **experimental hall**
  - 20  $\mu\text{Sv/h}$  for Simple controlled area (K3)
  - 100mSv/h for access restricted

- Shielding **100  $\mu\text{Sv/event}$ (K2)**  
1mSv/event (K3)

In the KEK regulation, there is no explicit description of ambient dose limit for beam operation conditions and beam loss classification such as SLAC-RSS

- Mis-steering beam loss

- **1 hour integration of dose rate should not exceed 1.5  $\mu\text{Sv/h}$  using radiation monitor.**

**(Terminate injection and wait 1 hour)**

SiD and ILD : Shielding capability of 250 mSv/h / 18 MW = 0.014 mSv/h/kW is required everywhere to meet SLAC requirement

Magnetic field  
issues for  
Detectors

# Limits of static magnetic field

Ministerial ordinance of Economic industrial ministry in Japan :

The technical standard regarding electric installation, 27th provision 2, 2011

less than  $200\mu\text{T}$  (2G) in the place where the person enters easily

Guidelines on LIMITS OF EXPOSURE TO STATIC MAGNETIC FIELDS, ICNIRP, HEALTH PHYSICS 96(4):504-514; 2009

ICNIRP : International Commission on Non-Ionizing Radiation Protection

**Table 2.** Limits of exposure<sup>a</sup> to static magnetic fields.

Exposure characteristics	Magnetic flux density
Occupational <sup>b</sup>	
Exposure of head and of trunk	2 T
Exposure of limbs <sup>c</sup>	8 T
General public <sup>d</sup>	
Exposure of any part of the body	400 mT ( 4KG )

<sup>a</sup> ICNIRP recommends that these limits should be viewed operationally as spatial peak exposure limits.

<sup>b</sup> For specific work applications, exposure up to 8 T can be justified, if the environment is controlled and appropriate work practices are implemented to control movement-induced effects.

<sup>c</sup> Not enough information is available on which to base exposure limits beyond 8 T.

<sup>d</sup> Because of potential indirect adverse effects, ICNIRP recognizes that practical policies need to be implemented to prevent inadvertent harmful exposure of persons with implanted electronic medical devices and implants containing ferromagnetic material, and dangers from flying objects, which can lead to much lower restriction levels such as 0.5 mT. ( 5G )