Institute of Nuclear Energy Safety Technology (INEST), Chinese Academy of Sciences (CAS), is the professional leading institute focusing on basic research of nuclear energy safety for both fusion and fission reactors, aiming to be the independent nuclear safety assessment and evaluation center to promote the sustainable development of nuclear science and technology in China.

In this work, fusion safety R&D activities will be presented. For example, The High intensity D-T fusion neutron generator (HINEG) is being developed and the first phase (HINEG-I) has been commissioning with the intensity of $1.1 \times 10^{12}$ n/s since December, 2015. Test campaigns are still ongoing and meanwhile the design and development of key components of the second phase (HINEG-II, $10^{14-15}$ n/s) is also in progress. It is highly expected to be a significant neutronics experimental platform for the validation of neutronics method and software, radiation shielding and protection, mechanism of materials activation and irradiation damage as well as neutronics performance of components. Moreover, the particle transport simulation software named SuperMC has been independently developed to support design optimization and safety assessment of nuclear systems, with the automatic modeling code SuperMC/MCAM passed ITER benchmarking and selected as the ITER reference code, and it is now being used in more than 600 institutions in 50 countries. Furthermore, a dual coolant thermal hydraulic integrated experimental loop (DRAGON-V) is under construction to support the engineering design validation of PbLi breeder blanket with its parameters covering the design requirements of ITER-TBM.

Additionally, INEST is leading the coordination efforts in fusion safety R&D in China, and the corresponding activities will be also be reported in this contribution.

**Keywords:** Fusion Safety; HINEG; SuperMC; DRAGON