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The new VTT Centre for Nuclear Safety

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VTT has been hosting the Finnish national hot laboratory infrastructure since the first nuclear power plants were constructed in Finland in the 1970's. Historically the principle radioactive materials handling has been for the testing of reactor pressure vessel steels, but over time the activities have broadened to outgrow both the capacity and capabilities of the existing facilities. As such, a decision was made in 2011 to build a whole new facility, with the additional goal of gathering most of the VTT Nuclear Safety research personnel currently scattered around the Otaniemi campus, into a single, compact facility called the VTT Centre for Nuclear Safety (CNS). The CNS is comprised of an office wing and a laboratory wing, and the laboratory wing is comprised of C-, B- and A-class radiological laboratories. Although the site is atop an underground parking garage, special attention was paid to optimizing the basement space, to exploit the natural gamma shielding offered by the granite. The VTT research staff has been integral in the design process, in order to assure that the laboratories meet the current and foreseen future needs. The C-class laboratories include radiochemistry laboratories, cleanroom facilities for trace element analysis, nuclear waste management research, and C-laboratory support facilities like an electronics shop and utensil cleaning and storage. The B-class radiological laboratories contain the controlled entrance area (also used for accessing the A-laboratory), an iodine filter laboratory, radiochemistry laboratory with nuclear material handling allocation, and a mechanicals workshop. Microscopy facilities include a TEM on the B-laboratory side, and a SEM and light microscopy facilities in the A-class laboratory. The A-laboratory spans a part of the main floor shared with the B-laboratory, as well as the basement facilities. On the main floor it includes the hot cell high bay and the pilot hall, equipped with a 10 ton capacity bridge crane. The basement facilities are mainly for storage and handling of radioactive sources, specimens and waste, but include a liquid waste handling room, autoclave room and double hot cell. Transportation of radioactive materials into and out of the laboratory occurs by way of a separate, covered truck park, through an airlock into the basement. Transfer of radioactive materials within the laboratory is possible with a dedicated facility cask handled by the bridge crane and/or a cart. Overall the design process carried out over the last two years has yielded very satisfactory results and the facilities can be expected to serve the purposes well.

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