SPEAKER / PRESENTATION INFORMATION

Name	Robert KILGER	**Phone**	+49 89 32004 498
Company / Organisation	Gesellschaft fuer Anlagen- und Reaktorsicherheit GRS mbH	**Alt Phone**	+49 160 93 80 46 07 (mobile)
Company Address	Forschungsinstitute 85748 Garching n. Munich Germany		
Email	Robert.Kilger@grs.de		
Biography	Dipl.-Phys. Dr. rer. nat., thesis at University of Ratisbon in 2000; Since 2003, he has worked with GRS in the Nuclear Fuel Department as a Criticality Safety Expert; Involved in safety assessments for German facilities for fuel fabrication, transportation, storage and disposal, co-author of the German Handbook for Criticality, joined NEA Working Group on BUC in 2004, Member of German Working Group on Criticality Safety of DIN; since 2003, he has been in charge of several studies on criticality safety for direct disposal of SNF in Germany.		
Title	***Criticality Issues of Direct Disposal of SNF and Fissile Waste***		
Abstract	Criticality safety for disposal of fissile material and SNF is a challenge in several respects. First, the demonstration of sub-criticality in the operational phase of the final repository is a “classical” task of criticality safety, even if new tracks like burn-up credit application are being pursued. In general, criticality safety of the SF canisters or waste packages has to be demonstrated for handling and storage under normal and accidental conditions. Burn-up of SNF as well as neutron absorbing materials may be considered appropriately. Second, the criticality analysis for the post-closure phase is a much more challenging exercise, which requires co-operation and expertise from different areas, such as geology, geo-chemistry, criticality, and perhaps probabilistic analysis. Important parameters determining the extent of such analyses are for instance, the characteristics of the waste packages, the fissile content of the waste or SNF, the geologic conditions (host rock of the repository, long term behavior of the system) and the time frame to perform the analysis. Deterministic as well as probabilistic methods may be applied, depending on the type of approach. The third issue of disposal criticality analyses is the determination of possible consequences of a hypothetically assumed critical system in the post closure phase of a repository. The objective of such an analysis, which may be performed additionally, is to evaluate possible effects on the stability of the barrier system of the repository. From these tasks, requirements on the codes and data used for the analysis arise if the analyses are to be done for a licensing application of a planned disposal facility. Special attention has to be given on validation of nuclear data of material mixtures, which are typical for geologic disposal (e.g., salt rock, clay, and crystalline rock). Important nuclides in this context are Cl, Si, Al, Fe, Ti, Ca, Mg, Mn, S and P. Furthermore, comparison of codes for nuclide inventory and criticality calculation is		

	an important issue. Regarding the validation of codes for critical excursion analysis under geologic conditions, systems providing a very low reactivity supply may be of special interest. In the presentation, these aspects will be discussed in more detail. Examples from criticality analysis for direct disposal of SNF in Germany will be presented. Possibilities for improvement of code validation and specific nuclear data for disposal criticality analysis will be discussed.