

635

ASSESSMENT METHODS TO COMPARE THE EXPECTED LONG-TERM PERFORMANCE OF SEALING ELEMENTS

TOPIC 10: Technological operations and performance assessment of components

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Abstract

Assessment methods to compare the expected long-term performance of sealing elements

The connections between the surface and underground facilities of a geological disposal facility represent an important sub-system of the design of the complete facility. Both, shafts and ramps are possible connections. During the operating period, connections to the surface are a bottleneck for all kinds of material fluxes, including the transport of waste, personnel as well as of supplies for the underground facility. Concerning post closure performance, the surface connections represent a disturbance in the geologic barrier and require special attention during closure. The list of related assessment criteria is long, however, those concerning construction and operation predominate. For existing German GDF concepts in claystone as well as other host rocks, BGE TECHNOLOGY GmbH initiated a comparison of sealing concepts for shafts and ramps. The overall goal of the work is to provide a general method of how to compare the long-term performance of such sealing systems and thus give an additional assessment criterion for the selection of suitable surface connections. The contribution will present the general method for comparing the long-term performance of sealing elements inside shafts and ramps. The method will be illustrated using an example. Characteristic properties such as the hydraulic conductivity, hydraulic resistance, and mechanical stability are used for the assessment. Additionally, a parameter study of the input parameters is carried out. As result, the most sensitive properties for both shaft and ramp sealing systems with regard to their long-term performance are identified.