

Robust Record Preservation system on Geological Repository

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As the geological disposal of High Level Radioactive Wastes is based on the passive safe concept both of the engineering and natural barrier, human controls such as long term record preservation is not necessary to maintain its long term safety. However how to increase the confidence building is an important issue to progress geological disposal program with the step-wise decisions. Transfer of information relevant to safety of repository to future generations is one of the human controls or institutional controls. As we could not predict the future society, we need to construct the robust and redundant system to transfer information, which should be understood by the future generations. Paper, microfilm and digital recording media are popular and useful, but their long term durability is highly dependant upon the environmental conditions.

We've investigated historical, archeological and societal issues and clarified the requirements for strengthening robustness and redundancy and also formulated the adaptable elements to attain the long-term record preservation system with robustness and redundancy.

Furthermore we've developed the laser-engraving technology onto silicone carbide plate, which is the most durable artificial material in the world in terms of strength, corrosion resistance and wear due to abrasion. It would be possible to preserve documents without the need for sophisticated preservation environment controls and without the need for human intervention to initiate a duplication program for over 1,000 years. For example, we've demonstrated to convert five hundreds pages of an A4 sized report to 42 square silicon carbide plates, 10cmx10cm and 1mm in thickness. Silicone carbide would be an alternative of paper and also be possible to be an alternative of microfilm utilized as digital recording media.