Abstract

Systematic handling of requirements and conditions in compliance with waste acceptance requirements for a radioactive waste disposal facility

Summary
This Abstract and presentation will demonstrate the need for a structured requirement management and draw upon experiences and development from SKB requirements data base and methodology, in addition to international guidelines and software tools. The presentation will include a discussion on how requirement management can be applied for the decommissioning area.

Background
The key issue in the decommissioning of nuclear facilities is the progressive removal of hazards, by stepwise decontamination and dismantling activities that have to be carried out safely and within the boundaries of an approved safety case.

For decommissioning there exists at least two safety cases, one for the predisposal activities and one for the disposal facility, and a need for a systematic handling of requirements and conditions to safely manage the radioactive waste in the long term.

The decommissioning safety case is a collection of arguments and evidence to demonstrate the safety of a decommissioning project. It also includes analyzing and updating the decommissioning safety case in accordance with the waste acceptance criteria’s and the expected output, i.e. waste packages. It is a continuous process to confirm that all requirements have been met.

On the other hand there is the safety case for a radioactive waste disposal facility, which may include the following processes and requirements:

i) Integrating relevant scientific (and other) information in a structured, traceable and transparent way and, thereby, developing and demonstrating an understanding of the potential behavior and performance of the disposal system;
ii) Identifying uncertainties in the behavior and performance of the disposal system, describing the possible significance of the uncertainties, and identifying approaches for the management of significant uncertainties;
iii) Demonstrating long-term safety and providing reasonable assurance that the disposal facility will perform in a manner that protects human health and the environment;
iv) Aiding decision making on the authorization / licensing of radioactive waste disposal; and
v) Facilitating communication amongst stakeholders on issues relating to the disposal facility.

How can we ensure and control compliance with WAC during Predisposal activities?
The link between the safety cases of Predisposal activities and the Disposal facility is primarily the Waste Acceptance Criteria (WAC), defined as “those requirements that are to be met by conditioned radioactive wastes, forming packages, to be accepted at an Interim Storage or a Disposal Facility”. It is advised that also WAC should be set up for each stage of the predisposal activities in the Waste Management Plan or Strategy.

Waste characterization requirements are typically developed from disposal performance assessment in addition to waste acceptance criteria (WAC), process control and quality assurance requirements, transportation requirements, and worker safety requirements. A matrix showing where each WAC

originates can greatly assist with understanding the philosophy behind the overall characterization program and put the elements into context.

The complexity of waste categorization requires the need for systematic handling of requirements and conditions during Predisposal activities.

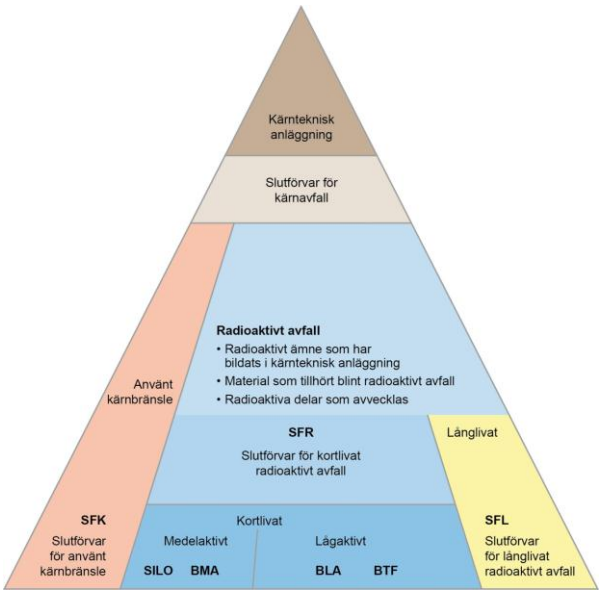
How can we ensure the fulfillment of WAC for a radioactive waste disposal facility?
Requirements management, sometimes called configuration management, is an area that recently has received increasing attention in the project management context. There exist international guidelines on the use of configuration management within an organization and it is applicable to the support of products from concept to disposal.

It first outlines the responsibilities and authorities before describing the configuration management process that includes configuration management planning, configuration identification, change control, configuration status accounting and configuration audit. The methodology develops a clearly defined list of requirements, a basic configuration, which is the basis for controlling and reporting documents such as product descriptions, manufacturing instructions, operations - and maintenance instructions.

Systematic requirement management identifies all of the requirements and design criteria of the involved stakeholders. The requirements are developed on several levels, from global level to detailed level depending on the product's complexity and are then verified and validated continuously before handing over the product to the operating organization, validated that the product meets the pre-defined objectives.

Requirements, and dependencies between them, can be traced through all phases which include support decisions about changes in the project and product development. Systematic requirements management also contributes frequently to better communicate with project stakeholders.

Below is an example of how facility requirements are organized at SKB for the disposal facilities SFK, SFR and SFL (note: System Requirements and Component Requirements are not included in the picture below).



Objectives and goals?

As important as the relationship between requirements for the radioactive waste disposal facility and the predisposal waste activities and the end products, is to ensure how the operator is planning to demonstrate that the requirements are met, e.g. in the form of waste packages and waste streams.

The systematic requirements management will provide support for the operator and assist in meeting the set requirements by answering the following questions:

- What are the requirements to be met and how and at what level of detail these have been considered?
- How the operator demonstrates that these requirements have been met?
- What are the requirements that can be decided at a later stage?
- How does the operator intend to demonstrate that such remaining requirements are met?