CORA-CALCOM

Database-supported program system for the planning and cost calculation of the decommissioning of nuclear facilities

CORA-CALCOM is a database-supported program system for the planning of decommissioning and dismantling projects for nuclear facilities. It enables the creation of a project structure, the determination of costs, personnel expenses and the recording of components with integrated waste disposal planning.

Siempelkamp

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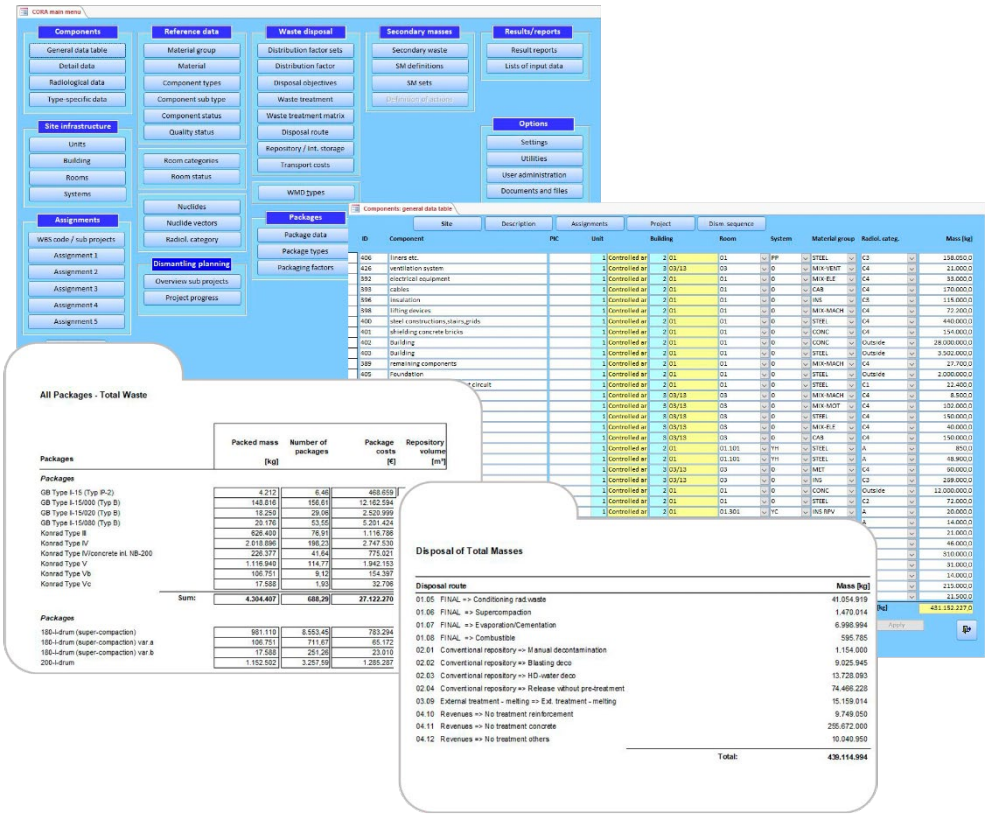
The dismantling of nuclear facilities is a complex task that takes a long time and requires substantial resources. The planning of such a dismantling project requires and generates large amounts of data, for whose management CORA-CALCOM was designed as a database-based program system. CORA-CALCOM accesses plant-related data stored in an inventory database. In this way, CORA-CALCOM makes it possible to plan the disposal of residual materials and radioactive waste arising from the dismantling of a nuclear facility.

The program system CORA-CALCOM is based on a combination of MS-Access frontend (application) and backend databases in MS-Access format (a connection to an SQL server database is also possible). CORA-CALCOM contains the modules:

- CORA (Component Registration and Analysis) and
- CALCOM (Calculation and Cost Management).

The development of CORA-CALCOM has benefited from our more than 40 years of experience in the planning and cost calculation of nuclear decommissioning projects.

Registration and characterization of the plant inventory with CORA



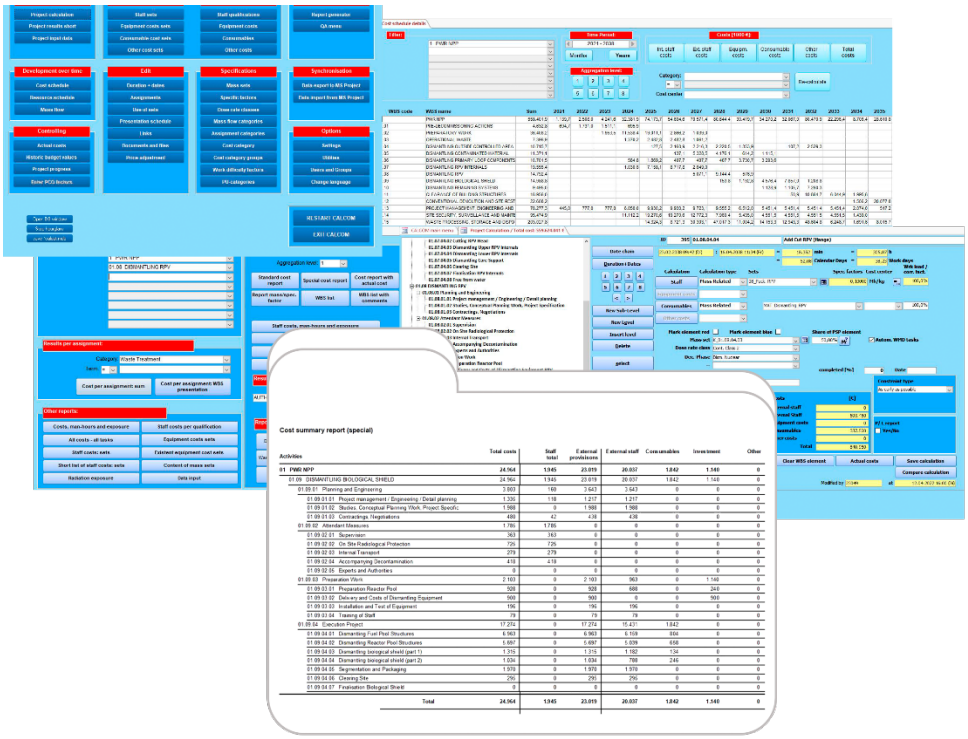
The database-supported program CORA is designed to register and characterize the inventory of a nuclear facility to be dismantled (masses, technical component data, material properties, radiology, spatial data, etc.).

This is one of the most important principles of mass planning and calculation. Equally important is the provision of the necessary data for the disposal planning of residual materials and radioactive waste (activity values including contamination and activation as well as dose rate values, but also information on pollutants), which can be recorded with CORA.

The main functions of the CORA program:

- Storage of all inventory data in a central database (including characterization of components, plant components as well as buildings and rooms with regard to decommissioning planning).
- Quick evaluation and assessment of the radiological condition of components and rooms on the basis of radiological characterization or categorization using contamination or dose rate values and nuclide vectors.
- Calculation of the secondary masses that result from dismantling, residual material treatment and building decontamination.
- Development of a disposal concept for residual materials and radioactive waste with the help of distribution factors for components, allowing the disposal path (which includes the treatment method and the intended disposal objective) to be defined.
- Calculation of the quantities of waste disposal masses and radioactive waste.
- Determination of the costs of the intermediate and final storage containers required for packaging the radioactive waste generated and the resulting final storage volume.
- Provision of inventory data, which in CALCOM serve as the basis for mass-based planning and calculation.
- Processing of the data and results through a variety of evaluations and analyses.
- Export of the most important results to MS-Excel, e.g. for graphical presentation of the results.

Project planning and cost calculation with CALCOM



calculate the associated personnel and material costs, personnel requirements and radiation exposure. Planning is based on the work breakdown structure (WBS), which constitutes a hierarchical structure of the dismantling project. CALCOM makes it possible to create a WBS with up to eight hierarchical levels. Schedule dependencies or restrictions can be defined in a similar way to what is known, for example, from MS Project. Schedules created in CALCOM can be exported to MS Project to be displayed as Gantt diagrams.

For the cost calculation, CALCOM provides various calculation models (e.g. mass, time and cost-related) for personnel expenses and costs, investment costs, consumable costs and other material costs. In order to allow the project planner to track the total hours of a project in CALCOM, CALCOM can also be used to record actual costs and assign them to the project structure.

The main functions of the CALCOM program:

- Hierarchical structure of the dismantling project, which can be adapted specifically for each project. This includes the number and definition of planning levels (e.g. phases, subprojects, steps, tasks) as well as their contents and links to each other. Existing project and cost structures can be adopted.
- Mutual data exchange with the MS-Project, so that all options for project planning and tracking (e.g. schedules, resource planning) are available.
- Mass-based calculation through direct access to the inventory database of the CORA program system.
- Calculation on the basis of various calculation models (e.g. mass, time and effort related).
- Automated and standardized calculation regarding residual material management and disposal of radioactive waste.
- Separate calculation of workload, personnel and material costs at any level of the WBS.
- Automated and standardized calculation of residual material processing and disposal of radioactive waste.
- Calculation of the temporal cost distribution (annual costs), the personnel requirement as well as the masses to be dismantled or the residual materials to be treated from dismantling.
- Export of the results to MS-Excel for further processing.
- Export of the schedule to MS-Project for further analysis of schedule dependencies and for presentation of the schedule as a Gantt diagram.

In view of the complex tasks involved in the planning and calculation of nuclear dismantling projects, CORA-CALCOM offers support in:

Mass determination
- On-site data collection
- Analysis of material flows and radiological inventory
- Determination of the dismantling and disposal masses

Generation of a hierarchical project structure
- Definition of dismantling phases, subprojects, work packages and work steps

Project scheduling
- Linking of work steps
- Definition of project milestones
- Determination of the time-critical path

Cost calculation
- Definition of hourly rates for qualifications
- Specification of cutting techniques, tools and equipment
- Specification of residual material treatment processes

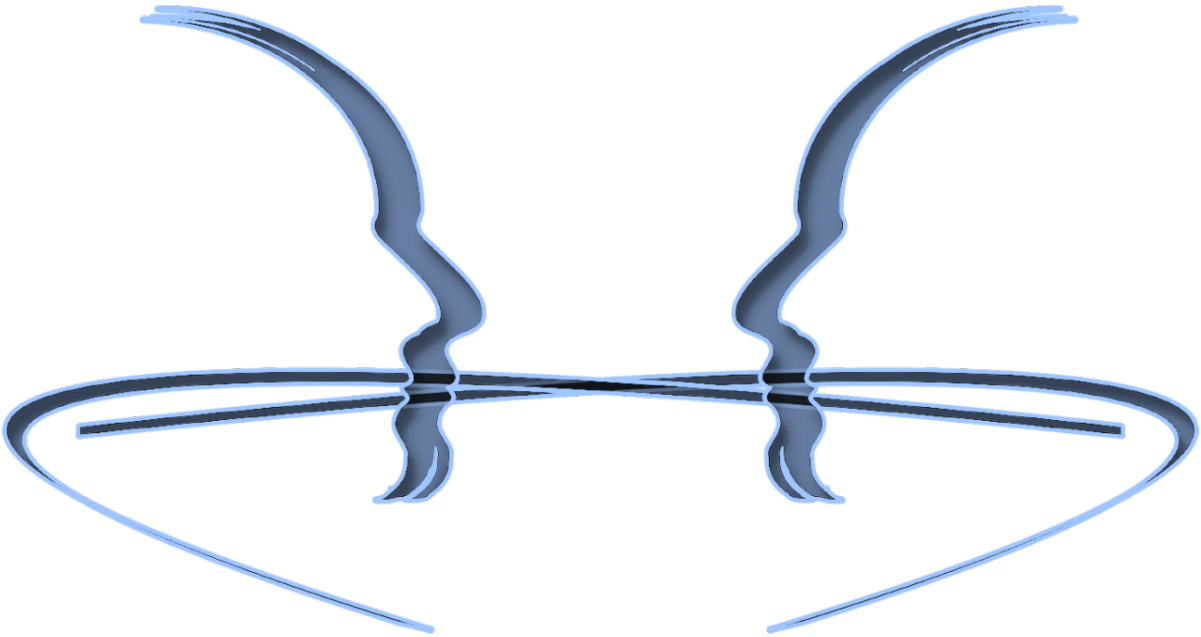
- Total Costs
- Cost per cost category Cost flows (temporal distribution)
- Planned-/actual-costs

- Staff requirements decommissioning project (total and per qualification)
- Staff requirements per year

- Assessment dose rate of staff

- Work Breakdown Structure (WBS)
- Time schedule

- Container requirements (quantity and costs)
- Intermediate and final store volume
- Time distribution of the dismantling and disposal masses as well as the containers



Based on more than 40 years of experience in nuclear technology, CORA-CALCOM was created as a tool that is used in the complex calculation of provisions for the dismantling of German nuclear power plants as well as in the calculation of dismantling projects in the EU.
When using CORA-CALCOM, we support and advise you as a competent and reliable partner.

Our engineers are experts in matters relating to the decommissioning and dismantling of nuclear facilities.

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Intelligent engineering
for future generations.

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