

## Central Radiological Computer System

### Radiological Surveillance and Emergency Preparedness During Normal Operation and Within Accident Situations

A real life accident will not follow a fixed scenario and will deviate from conservative / covering analyses.

#### Challenge

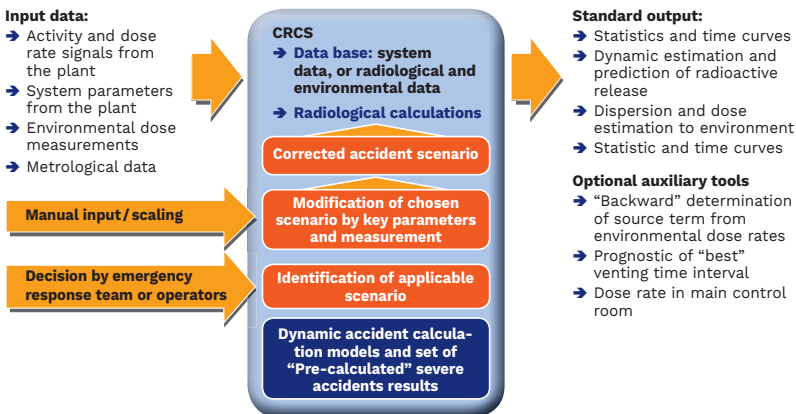
In radiological emergencies, nuclear power plant (NPP) operators require tools to assess and minimize any radiological risk to the public and potential dose to workers and emergency response personnel. On-site areas must be checked to determine if limits are to be placed on where and how long a worker can stay in a specific plant area. The associated main questions are:

- What is the radioactive source term of a design exceeding accident?
- What is the impact of such accident on the surrounding area?
- How can those impacts on the population be assessed and at least minimized?

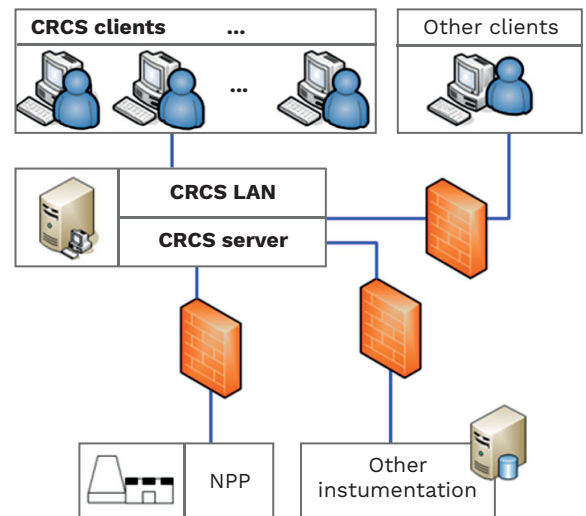
Radiological tools for emergency preparedness and emergency response tools must provide answers in real time, must be versatile and easy-to-use.

#### Solution

The Central Radiological Computer System (CRCS) supports your radiological staff during normal operation and within accident situations in order to improve your NPP's emergency preparedness and response. CRCS is a dynamically adaptable tool for the prognosis and determination of radioactive releases (source terms) to the environment. It is coupled to the process and information system of the plant and is performing automatic analyses based on current process value data.



CRCS system characterization



Software runs on the standard computer system LINUX

#### Customer benefits

- Provides support to your NPP's radiological staff during normal operation and within accident situations
- Modular and easily adaptable to site-specific needs and instrumentation and control of plant
- Software runs on the standard computer system
- Improves your NPP's emergency preparedness and response
- Dynamically adaptable tool for prognosis and determination of radioactive releases (source terms) to the environment

**Your performance**  
is **our** everyday **commitment**

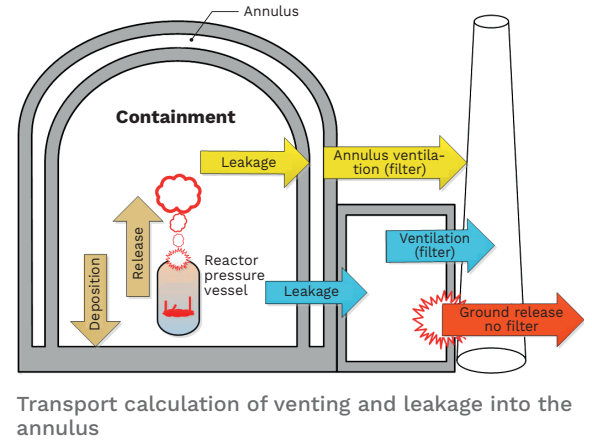
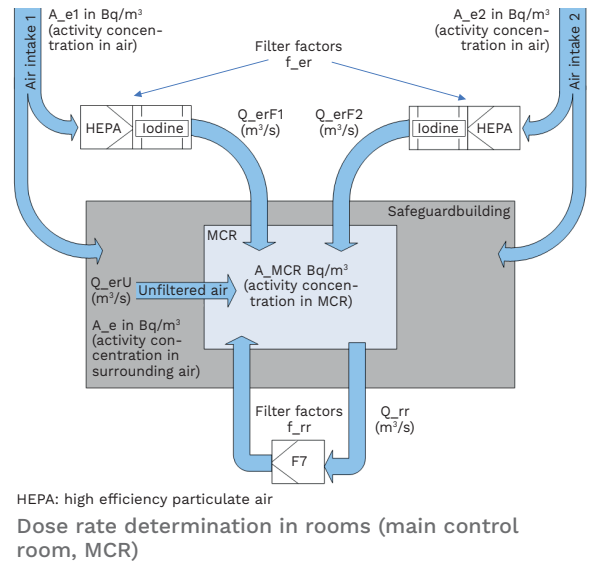
# Technical information

## CRCS:

- Processes the site- and situation-related input signals:
  - NPP's activity and dose rate signals (systems, rooms, etc.)
  - NPP's system parameters (flows, temperatures, etc.)
  - Environmental dose measurements
  - Meteorological data
- Provides detailed information about:
  - Activity releases into the environment
  - Activity in rooms and systems
  - Atmospheric dispersion and dose assessment
- Continuously assesses:
  - Dynamical estimation and prediction of radioactive releases
  - Dispersion and dose estimations
  - Database for radiological samplings
  - Statistics and time curves.

Optional auxiliary tools can be implemented, e.g.:

- "Backward" determination of source term from environmental dose rates
- Prognosis of "best" containment venting time interval
- Dose rate in main control room
- Core damage estimation
- Steam generator leak rate estimation.



**Scenario modelling (high-dimensional MDEQ, FSAR-based)**

**Predict dose rates, activities, ...**

**Dispersion analysis**

**Dose rates in environment**

**Update plant state parameters**

**Compare to reality**

**Real-time process values**

**Meteorology: real-time data or scenario**

FSAR: final safety analysis report  
MDEQ: Michigan Department of Environmental Quality

Accident scenario modelling

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