Update of the safety report of the nuclear section of 1300Mw

Objectives

Revamping safety report following the decade examination
The safety report synthesizes dispositions taken to ensure a safe lead of nuclear thermal power stations. Particularly, this report (volume: 8 sorters of 300p; 150chapters) includes the description of materials modifications, realized actions following the incidents,the action to be taken in the event of accidents or post-accident, etc.

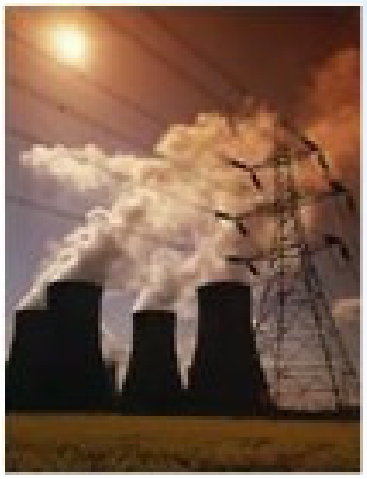
Our way

(a)For the modifications: Documentary update (text, references index). Redaction shows that the provisions allowed to control the risk on the following criteria: installations integrity (barrier), radioactive substances containment, evacuation of the released power. The modification concerned about thirty chapters for a volume equivalent to 1 sorter.
(b)Checking of coherence (ex: reference) and of the homogeneity (ex: redaction) of the whole report after revamping.

Difficulty : to have the up to date sources and to maintain coherence in spite of the update.

Results

Safety report achieved is ready, within given delay, to be read again by the nuclear authorities



Performing calculations for the radiation protection design of radiological protection of a storage facility for radioactive waste packages

Objective

Check the compatibility of new waste package vis-à-vis the protection against radiation in the existing storage facility, as part of a safety case for the Nuclear Safety Authority.

The challenge: Making all calculations in a limited time (1 months

Approach

Analysis of energy spectra of different packages to store
- Identification of spectral envelopes
- Modeling and installing different measurement points
- Monitoring and verification of calculations results
  Writing a summary
- Difficulty: The input data had to be reprocessed to be exploitable

Results

- Determination of the equivalent rate of dose for all measurement points
- Identification of unacceptable procedures with regards to personnel exposure to radiation
- Validation of existing protections for new package store

Client benefits

- Acceptance of safety case by the Nuclear Safety Authority
  Delivery of results of calculations in the time expected

French National Marine Liquid Radioactive Waste Analysis

Organisation of the management and characterization of liquid radioactive wastes.

Context & Objectives

Context : French navy decided to construct a liquid radwastes treatment plant in order to process and facilitate storage of radioactive waste produced by submarines.

Objectives : The objective of the project was to ensure the logistical organisation of the transport from each liquid waste production harbours to the Treatment plant and to prepare a chemical analysis of the liquid radioactive waste.

Approach & Solution

Phases of the project:

- Transport means analysis
- Annual and monthly flow analysis of produced liquid radwaste
- Synthesis of known chemical characteristics of liquid waste
- Choice of additional chemical characterisation needed
- Subcontracting a laboratory to make the analyses
- Results analyses
- Identification of problems and proposition of solutions

Results & Added Value

At the end of the project, Hémisphères delivered different technical and financial reports concerning:

- Liquid waste transportation possibilities
- Synthesis of chemical analysis results
- Results analysis
- Cost analysis.

Key differenciators

Knowledge of the client, and of the multiple actors participating of the project such as CEA (French Atomic Energy Commission), DCN (French naval defence company), DGA (French government agency conducting development and evaluation programs for weapon systems).

Updating the evaluation tools of de l'impact dosimétrique of the rejected radioactive effluents

Objective

Upgrading exisiting tools Focon96 and Aquarej 2.5 and their documentations
Challenges : Facilitate the evaluation work and upgrading the tools in quality

Our Approach

Focon96 and Aquarej2.5 :
Inventory of tools and their documentation
Update documentary versions available

Focon96 :
Successive development of 3 new versions
Integration of new parameters (age classes, ZEAT, radionuclide)
Modification of library references
Realization of associated documentations
Definition of plans and test validation

- **Difficulty**: volume of data and data management capacity
  → **Solution made :** Optimisation of reference data to store and use

Results

A version of Focon96 with:
- A library updated with:
  - 6 classes of age
  - 17 Areas of Study and Planning
  - 177 radionuclides in 497 forms
- a Documentation
- a test plan and validation

An inventory of tools and improvement

Clients Benefits

Reducing the time taken for effectuer une expertise de dosimétrie
Alignment depending on the quality of documentation
Traceability in the design and implementation tools

Revaluation of the safety of a basic Nuclear Installation with a seismic risk

ALTRAN

Objectives

To show the seism resistance of the important mechanical equipment for the safety of the nuclear reactor (block pile, heavy water circuit, handling flashes of combustible matter, thimbles)

The challenge: to show the seism resistance of the current equipment. A new design is prohibitory.

Our way

Complete project :

- Definition of the studies and work to be realized.
- The estimate of the costs and the deadlines
- The planning and invitations to tender
- Follow-up of construction site
- Validation of the twenty files before being sent to the Authority of Safety

Characteristic: we avoided the expensive tests while exploiting more than of habit the codes of dimensioning.

Results

- Particular studies of the critical points; no reconception was necessary.
- Delivery of the files, according to contract, to the Authority of Safety; the restoration of the equipment was carried out before the restarting of the nuclear reactor.

Client Benefits

1. Substitution of the tests envisaged on the equipment by thorough calculations (profit: 100 K€ on the budget).
2. Realization of sales leaflets starting from old data of tests filed instead of new calculations (heavy, times too long, high cost)

Mise à jour du rapport de sûreté des tranches nucléaires de 1300Mw

Objectif

L'enjeu: remise à niveau du rapport de sureté suite à la visite décennale.
Le rapport de sureté synthétise les dispositions prisent pour assurer la conduite sure des centrales nucléaires. En particulier ce rapport (volume : 8 classeurs de 300p; 150 chapitres) comprend la description des modification matérielles, les actions réalisées suite aux incidents, la conduite à tenir en cas d'accident ou post-accident ,etc.

Notre démarche

(a)pour les modifications : mise à jour documentaire (texte, index des références). La rédaction met en exergue la preuve que les dispositions permettent de contrôler le risque sur les critères suivants : intégrité des installations (barrière), confinement des la matière radioactive, évacuation de la puissance dégagée. La modification a porté sur une trentaine de chapitres pour un volume équivalent à 1 classeur.
(b)Vérification de la cohérence (par ex. les renvois) et de l'homogénéité (par ex. la rédaction) de l'ensemble du rapport après la remise à niveau

Les difficultés : disposer des sources à jour et maintenir la cohérence malgré la mise à jour.

Résultats

Le rapport de sureté achevé est prêt, dans le délai imparti, à être relu par les autorités nucléaires