



Internship and Thesis Projects at Tractebel

THESIS

D&D CAPEX Calculator

Nuclear Physics – Health Physics

Business line: Nuclear - Radioactivity Management

Type: Master Thesis

Site: Brussels Engie Tower, homeworking possible

Who is Tractebel?

Tractebel, part of the Engie group, has over 150 years of experience and is one of the world's largest engineering company. Tractebel offers its customers multidisciplinary solutions in the fields of energy, nuclear, hydraulic and infrastructure. Our teams are involved in all phases of a project, from feasibility studies to implementation.

What will you be working on?

The use of nuclear technology for medical applications is currently growing with the development of nuclear medicine (diagnostic and therapeutic) and radiotherapy. Fifty percent of all people will benefit from nuclear medicine during his/her life.

As a consequence, the need for medical radioisotopes is globally increasing: use of gamma, beta and alpha emitters, development of new radiopharmaceutical compounds and new diagnostic and therapeutic protocols bring new hope for cancer patients.

The use of research reactors and particle accelerators are the main production routes for medical radioisotopes. In some cases – due to the production process and the half-life of the radioisotope – this production process requires a specific and geographically local particle accelerator (cyclotron, LINAC), increasing the need for production facilities.

New projects (new build), looking at the total cost over the entire facilities lifespan, include the need to estimate the future dismantling strategy, planning and cost of decontamination, decommissioning and dismantling (D&D) of the facility. In some cases, this value is part of the GO / NO GO decision to start a new project.

Today, Tractebel has built experience in the D&D of industrial medical radioisotopes production facilities including cyclotron and cyclotron vaults, irradiation vaults, hot cells and R&D labs.

Description of the work

First, the student will familiarize himself with the physics of radioactivity, interactions of radiation with matter and activation, as well as the regulatory framework related to the management of radioactive waste (free or conditional release, recycling, acceptance criteria and associated costs...).

In a second step, he/she will develop an automatic calculator (e.g. based on Excel) allowing a first and rough estimation of the D&D cost taking into account the specificity of the new facility: bunker (mass and thickness of concrete), specific equipment (particle accelerator), labs with hot cells...

In a third step, the tool should allow to estimate the cost of several D&D and/or various building strategies, allowing the optimization of the design to reduce the D&D scenarii cost.

What profile are we looking for?

- You speak fluently Dutch, French or English.
- You are studying Applied Physics Engineering or Physics.
- You wish to do a master thesis in a large enterprise.
- Knowledge of hardware programming is an advantage.
- You are driven by the search of innovative solutions.

- You are curious and have an initiative mindset.

What do we offer?

- An interesting and varied thesis in a large nuclear engineering company.
- An environment that allows you to strengthen your technical skills.
- The opportunity to receive professional guidance by experts in different fields of engineering.

How to apply?

Do you think that Tractebel is the perfect fit for your internship?

Send us an e-mail to STEVEN.PEETERMANS@TRACTEBEL.ENGIE.COM and CANDICE.DEJONGHE@TRACTEBEL.ENGIE.COM with your CV and a few lines of motivation.

We hope to see you soon!