



ASSESSMENT 2

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Introduction

The project for the Hinkley Point C nuclear power station in England has been approved by the government. The project will be taken over by the French company EDF with its Chinese partner CGN, and the British government as another financier. The construction cost is £18 billion, and the power station is expected to be operational in 2026.

Right at the start of the project, there were many critical issues concerning time, cost, and quality estimates. For a successful project, these three factors must be a major focus. The Hinkley project had an increase in cost and construction time, and there were also shortcomings in quality that negatively affected the entire project.

Increasing these factors leads projects down the road to failure, due to these increases and inadequate tools the project will not be in line with what was promised, and this affects success in a very negative way.

In the following paper we will look at the cost, time and quality situation of the Hinkley Point C project and highlight the importance of these three for the success or failure of the project.

Hinkley Point C nuclear power plant

In 2015 the UK government gave the go-ahead for the construction of the Hinkley Point C nuclear power station, on a stretch of Somerset coast not far from the Welsh border, this was the first nuclear power station in over two decades (Comptroller & General, 2017).

The Hinkley Point C nuclear power plant is based on the European Pressurized Reactor or Evolutionary Power Reactor (EPR) technology supplied by French partner EDF, is scheduled to be operational in 2023 and is expected to generate around 7% of the UK's electricity production.

In the original vision, the Hinkley Point C project would have generated many benefits for the UK government, including social and economic benefits such as many job opportunities that could potentially change people's lives, and lead the country to a transition to a low-carbon energy future.

From the outset, the Hinkley Point C project showed many critical issues, in terms of time, budget and quality, which put it on the road to failure.

According to Simon & Murray (2018), the three factors that determine a successful project are adherence to schedule, its quality and adherence to the allocated budget, also called the project management triangle. A project that is on time, stays within its budget and has a satisfactory outcome is, in theory, a project that will be successful.

What characterizes a project is that it is usually unique and usually executed only once, with only one chance to effectively manage the time, cost, and quality of the project output. For this reason, a professional project manager (PM) is hired to oversee the success of the project, where the PM must assess time, cost, and quality, which will be the three major elements in management during the project lifecycle to ensure that it is completed on time, within budget and meets quality expectations (Simon & Murray, 2018).

Triple constraints

A very important aspect of managing time, cost and project quality is the interconnection of these three distinct but interdependent elements, and how any change to one of these factors creates an effect on one or both others. This is why they are called 'triple constraints' that the PM must manage.

The triple constraint model imposes a dilemma in project management in which each individual component of the triple constraint, any changes to one parameter will affect the other two, effectively entering competition that affects the success of the project. If one thinks of the shape of the triangle, for it to remain as it is, a change to one of the three sides necessarily entails a change to at least one of the other two (Jenkins, 2022) .

Looking at the Hinkley Point C project, we are going to evaluate the three big elements for a successful project, cost, time, and quality, which are not in line with what was planned for the design.

Costs

In the field of project management, cost estimation is the process of forecasting the economic resources required to complete a project. Initial estimates are often used in the first planning phase and can determine whether a project will go ahead or not.

Once the project has been approved, it becomes necessary to make another, more detailed cost estimate to determine the budget that will be able to appropriately allocate the various resources during the project life cycle. This is why correct cost estimation is important (Simon & Murray, 2018).

The Hinkley Point C project, approved in 2016, EDF estimated the cost at £18 billion. In February 2023, the French energy company EDF's project will cost £33bn, which is much higher than the initial budget (Harvey, 2021).

The project costs are borne not only by the French company EDF, but also by the government of England and the Chinese group General Nuclear Power (CGN), which owns a 33% stake in the project (Cossins-Smith, 2023).

EDF stated that this cost increase will not affect the costs for British employees or citizens. All these costs will be shared between EDF and its Chinese partner CGN.

The two companies have a basic agreement, where if the costs are higher, EDF can ask CGN to go to According to the agreement between the companies, higher costs mean that EDF can ask CGN to go and put in more capital for the completion of the project (Lawson, 2022).

According to Cossins-Smith (2023), the Chinese company CGN might stop financing the project if the capital it would have to commit is too high. The withdrawal of funding by CGN could mean that EDF will be forced to bear all costs with its finances alone. In 2022, EDF recorded a record net loss of around £12 billion, which shows that EDF will never be able to meet the costs.

In this case, it is evident that the cost estimate for the Hinkley Point C project was not properly carried out. The costs are continuously increasing with each passing year, exceeding the initial estimates more and more. Bankruptcy for this project is very close, due to these increases, which do not seem to stop, it could lead to abandonment by investors leading to the project being unfunded, this translates to construction having to stop leading to the project never closing.

Times

Every project requires a time frame and deadlines that are very important for success. The most important part of timelines and deadlines is to set them with a reasonable and realistic criterion, where you must be able to come up with a good estimate of how long the project should last formalized in days, months, or years (Simon & Murray, 2018).

On average, this is achieved by scheduling a project, which means determining the exact timing of the project and individual activities in its realization, where these activities may be independent or dependent with others in the project.

According to Simon & Murray (2018) once this estimate is obtained, which must be done based on an analysis of the project complexity and size, the "contingency time" must be added. This time can vary between 5 % and 50 %, which must be added to the estimated time depending on the project and sector.

The usefulness of these 'emergency times' is that unexpected surprises always happen during the execution of a project, which is why it is important to always allow yourself a little extra time in case of unforeseen problems to try to solve them without affecting the success of the project.

The French company EDF in 2016 estimated a construction time of 10 years, where it stated that the construction of Hinkley Point C would be ready in 2025. But in 2022, the company announced that it had postponed the generation start date to June 2027, failing to meet the first timeline estimate and breaking the deadline (Sillars, 2022).

EDG stated that these delays were due to the pandemic from Covid 19, where with government restrictions it was not possible to receive raw materials and personnel for the construction of the power plant was not available as before the pandemic.

According to Moore (2022), in 2022 reports have emerged suggesting that the centra will not be operational until 2036, which translates to a delay of 11 after the EDF's stated 2025.

The French company EDF has an agreement, an original one, with the British government in which the government is supposed to finance the construction project, but within this agreement there are some clauses, including that the government support would be cancelled if the project did not start producing energy by November 2033.

Looking at the progress of the project, there are many fears that the project will have further setbacks, leading to further delays. This misjudgment of the project's timeframe could cause the British government to withdraw after certain deadlines have passed, which could lead to the project running out of finances, causing the entire project to fail.

Quality

The quality of a product or service can be defined as a set of properties and characteristics that give it the title "fit for purpose". This means that this product or service must fulfil the requirements that have been declared (Simon & Murray, 2018).

In projects, quality means all those 'activities' carried out that serve to ensure that the project results are fit for purpose. All these "activities" must themselves be of a certain quality and must meet certain standards.

When it comes to the quality of nuclear power plants, considering the complexity of these construction projects, regulations and standards must be applicable at all stages and these must have high levels of

safety, reliability, and performance. The quality of nuclear power plants must be of a very high standard, if this is not according to the set standards, in addition to leading to the plant not being able to produce energy, it presents a great danger to the environment and people if radioactive substances are released, which can cause very significant disasters (IAEA, 2020).

The Hinkley Point C Project in 2017 during initial construction faced problems due to the quality of part of the foundation. The French company EDF stated that part of the foundation structure had inadequate concrete quality, this led to a change in the construction schedule leading EDF to have to demolish and rebuild this part of the construction affecting the progress of the project plan (SMITH, 2017).

The Hinkley Point C Project under construction by EDF Energy is based on the third-generation European Pressurized Reactor (EPR) technology with two reactors, designed by EDF itself. The same technology is used in many other parts of the world, where it is not entirely suitable. The EPR technology is in operation at two plants around the world, in Finland and China.

Before 2021, the power plant near Hong Kong was the only site operating with EPR technology, but in July of that year, the authorities had to shut down one of the two reactors due to a technical accident at the plant. In December 2022 in Finland, the Nuclear Safety Authority authorized the start-up of the nuclear reactor after many delays caused by inadequate initial operation after 12 years of construction delay (France-Presse, 2022).

This shows that this EPR technology presents many problems, the quality expected for a project of this size does not match what is achieved. Where feasibility begins to fail, the ongoing problems with the Hinkley Point C project still raise concerns about its future, especially its success.

Triple constraints - Hinkley Point C

To determine whether a project is a success or a failure at its close, one can go to the 3 constraints, cost, time, and quality, by asking the following questions:

- Was the project completed on time?
- Was the project completed on budget?
- Does the project meet the set quality objectives?

According to Bronte Stewart (2015), if the answer to any of these questions is negative, the entire project can be branded as a failure.

In all projects, a primary objective of time, cost and quality must be established. These primary objectives of cost, quality and time are strongly interconnected and are clear points for project success. During project management, these objectives must be well defined and clear throughout the project process.

On the status of the Hinkley Point C project, it was pointed out that these three objectives have not been adequately worked out. The construction time is always increasing, always causing the project to shift its deadline. Costs are always increasing with each passing year. Quality is flawed due to inadequate material and problematic tools. All these factors lead to the risk of financiers withdrawing, i.e. finding themselves without funds for the project, and never closing this project.

Managing a project of this magnitude is very complicated, the planning of which must be done with unique precision with no margin for error.

Cost and time estimates were not planned efficiently, whereas one can see that as time increases, so do costs. About quality, of the EPR technology, no in-depth assessment was made, which shows that this has had problems in other design constructions (Bryan, 2017).

Accurate project estimates help to understand project requirements even before the project starts. In this way, you can be sure that you have everything you need to successfully manage and complete the project, from adequate resources to a correct project budget and on time. In addition, an accurate estimating analysis also helps to define the expectations of all stakeholders, reducing problems due to risks that may be encountered during project construction (Gardiner & Stewart, 2000).

Conclusion

The Hinkley Point C Project has many problems, and these set it on the road to failure.

The costs of the project are much higher than estimated and this could result in the project running out of funds and not being able to be finished since the partner in the construction of the CGN project might withdraw. In terms of timing, this is also why if the supported agreements between EDF and the British government break down due to too many delays, it could lead to not having enough funds to finish the construction of the project. Finally, regarding the quality of this project, we have seen problems at the construction level that have led to delays, and in addition, the EPR technology has many issues that can also lead to further delays.

An analysis of the estimates made in the design of Hinkley Point C shows that these were not carried out effectively. Because of these inaccurate estimates, the Hinkley Point C nuclear power plant project is on the road to failure.

In project management, the importance of efficiently determining cost, time and quality estimates leads to a successful outcome without complications.

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