EDF – Telephone press conference

Speaker

Hello and welcome to the EDF telephone press conference. I'd like to hand things over now to Pierre-Franck Thome-Jassaud, Head of the Press Office. Over to you.

Mr Thome-Jassaud

Thank you very much. Hello. Thank you for taking part this morning in the press conference organised to accompany the publication of a press release on the Flamanville 3 project. I would like to thank Xavier Ursat for being here to answer your numerous questions.

Just after the publication of the press release, we sent you a link to a three-minute video produced to show you EDF's preferred scenario for the upgrading penetration welds. I will now hand things over to Xavier Ursat, for a brief introduction, after which we will take the time for you to watch the video. Mr Ursat will then answer your questions.

Mr Ursat

Hello. As Pierre-Franck just informed you, the press conference this morning was organised to accompany the publication of our press release and to fill you in as comprehensively as possible on the latest developments in the Flamanville 3 project, particularly for the upgrading the main secondary system welds, and notably penetration welds.

We have already explained the situation: the function of the steam pipes in the secondary circuit of a pressurised water reactor is to conduct the pressurised steam from the steam generators to the machine room to produce electricity. At Flamanville 3, these pipes were designed according to the "break preclusion principle", a principle ensuring high quality of piping and which, as a result, does not take into account a scenario where they break in safety studies. In the last few years, we have observed that this principle has been only partially described and rolled out with suppliers.

What's more, in spring 2018 (as we explained at a press conference in July 2018), EDF detected quality drift in some of the welds of the main secondary circuit at Flamanville and started additional inspections of the entire circuit.

Today, 58 welds need to be repaired, either because they present quality defects or because they fail to comply with the high-quality requirements of the break preclusion principle.

The circuit contains eight particular welds situated in the penetrations of the building, i.e. the place where the pipes cross through the wall of the Flamanville 3 reactor. We held lengthy discussions with the French Nuclear Safety Authority (ASN) between summer 2018 and June 2019 on what needed to be done about these eight welds, relating to the break preclusion principle. Following this review, in June 2019 the ASN also asked us to upgrade these eight penetration welds, located in the place where the pipes exit the reactor building, passing through the auxiliary buildings on their way to the machine room.

From 20 June onwards, EDF made intensive efforts, over the entire summer, to review the various possible scenarios for upgrading the penetration welds. We reviewed three scenarios in particular as part of a study that was completed during the summer.

Our work on selecting the scenario was informed by three important criteria. The first is controlling industrial risk. The second is being certain of the quality of the work, because as soon as we begin repairing the welds, we need to be certain of the top-level final quality. The third, naturally, is managing the schedule.

In consultation with the ASN, with which we shared numerous technical points this summer, the scenario favoured today by EDF is to upgrade the penetration welds using robots inside the piping in question. In a few minutes, you will see a short film showing how we intend to proceed. This technique was developed initially for operational plants and needs to be qualified for implementation in the secondary circuit of the Flamanville EPR. Four types

of robot will be used: one for grinding, one for cutting out the existing welds, one for bevelling the piping, and one for making the new welds.

For the moment, we are maintaining a second scenario as a fallback solution, in the event that the first scenario does not achieve the requisite quality. This alternative consists in dismantling and extracting the piping concerned to auxiliary buildings, outside the reactor building, where we will carry out the weld upgrading operations and reinstall the piping and all the equipment found in the auxiliary buildings.

Considering the strategy on favouring repair work by robots, EDF's Board of Directors yesterday afternoon approved the continuation of the Flamanville EPR site. Against this background, EDF is revising the schedule and the cost of the construction of the EPR. The provisional schedule to implement the preferred scenario for repairing the penetration welds, if the objective mentioned earlier (i.e. the approval by the ASN of the robot repair work) is met, results in a fuel-loading date of end-2022. We have re-estimated the construction cost at €12.4 billion, for an increase of €1.5 billion. This amount corresponds to the construction cost in 2015 euros. We are not changing the reference of our previous disclosures.

Between ASN approval and the start of the penetration weld upgrading, we will continue repairing the 58 welds in the secondary circuit with quality issues or which do not comply with the requirements of the break preclusion principle. In all, some 500 people will be mobilised for this phase, including 80 welders. The latter are currently being trained on the welding procedures so as to fully respond to the most stringent quality requirements.

Activities are continuing at the site, independently of these issues with the secondary circuits. As of today, 63% of the EPR's systems have already been transferred to the future operator. On 21 September, we began the final phase of hot functional test of the EPR, i.e. tests in the future temperature and pressure conditions of the reactor. Over 250 test procedures will be conducted in the final three months of the year, during which 12,000 safety criteria will be validated.

The hot functional tests of the Flamanville 3 EPR are the ultimate important global systems for verifying the correct functioning of the reactor. The last time the French sector carried out hot functional tests on a reactor in France was over 22 years ago, on the second reactor at Civaux. So, this is an important moment for our industry.

To recap the project schedule: the three coming months will be devoted to hot trials of the Flamanville 3 EPR. Next year will largely be focused on the continuation of non-penetration secondary circuit weld repairs. Towards autumn 2020, we will receive ASN validation of the definitive qualification of the robot repair process, which we will start with a view to completing development, and we envision fuel loading in late 2022.

Mr Thome-Jassaud

Thank you, Xavier. Now let us take two minutes to watch the video sent to you. Then we will take your questions.

Video viewing.

Q&A

Ms Descamps, *Europe 1*

Hello. You mentioned a plan B, involving dismantling and repairs, after dismantling the welds in question. In which precise cases could this plan B be implemented? Will the additional cost and the schedule be the same if you opt for this plan?

Mr Ursat

Thank you for your question, and hello. We would opt for this plan B (though we see this likelihood as low today) if we were unable to fully qualify the robots I mentioned earlier, and particularly the robot for the welds, with the ASN. We have a full work programme with the ASN, taking us up to autumn 2020. It's one that is extremely precise, because the important

work completed this summer has resolved a large part of the technical points. Now it's clear what we need to do. But definitive approval will be issued in autumn 2020.

So, we are maintaining our plan B, which we continue to work on, so as not to waste time if ever the robot plan is not approved. If we had to switch to plan B, we would communicate on the development in autumn 2020. According to our visibility today, this would in all likelihood lead to an additional delay of around one year and an additional cost of approximately €400 million. But, to repeat what I said: today, the plan A is the favoured plan and the work completed this summer gives us a good level of confidence in the plan. The point is, we can leave nothing to chance given the importance of the site and the situation. This is why we are maintaining our plan B.

Ms Boselli, *Montaigne News*

Hello. For the start of the EPR, rather than talking about commissioning you talk about fuel loading. Does this mean that the real commercial start-up occurs at that moment, or does it mean a few extra months for connection to the grid?

Mr Ursat

We are talking about fuel loading, which is an extremely important date in regulatory and technical terms, since it signifies the moment when we load nuclear fuel in the reactor core. In the days and weeks following this date, divergence – the start of the nuclear reaction – will occur. We will then gradually ramp up operations, connect to the grid and complete commercial implementation. It takes five to six months between loading and the full operation of the reactor.

Mr Romanens, *TF1*

Hello. Two, related, questions. The first concerns the eight penetration welds. You mentioned four types of robots. Do these robots exist? Or are they to be manufactured for this event and this event alone, seeing as there are four types, for four different operations?

My second question is about the 58 welds in the secondary steam circuit. What is the schedule for achieving compliance for the 58 welds?

Mr Ursat

Thank you for your questions. All four robots do indeed exist. The weld-repair robot is the one that calls for the greatest amount of qualification work. The three others are more simple, mechanical robots. All four robots exist and have already been used in the nuclear industry or in other industrial sectors. They were especially prepared for use at French plants, in the primary circuit, and have been used several times at sites outside France. So yes, they well and truly exist. Now we absolutely need to qualify them for the secondary circuit at Flamanville 3 with the ASN and achieve high-quality welds to respect the break preclusion principle. This is why we are carrying out qualification work, which will be an extremely meticulous task, between now and autumn 2020. The robots exist. It is an innovative process, but it is not an R&D issue or robots to be designed. The robots exist, and now need to be qualified.

The 58 welds will be repaired once we have completed the hot functional tests. The existing welds have nevertheless been approved by the ASN for pressurisation and for conducting the hot functional tests. We need the piping to be as is, until end-December, for the hot functional tests. After which, the 58 non-penetration welds will be repaired over the course of 2020 for compliance with break preclusion.

Mr Wakim, *Le Monde*

I have a few quick questions, just so I fully understand the situation. The ASN has to approve the robot technology, but this means that for the eight welds, no large-scale work is to be completed before autumn 2020. Does this mean that you will have to wait a year before beginning to repair the welds?

My second question concerns the steam generators at Flamanville. Relative to the defects identified on the steam generators produced by Framatome, we learned a few weeks ago that the steam generators at Flamanville were also concerned. So, are you taking advantage of this further delay to repair the steam generators? If so, will this also generate additional delays and costs?

Lastly, I have a question about the approval by the Board of Directors of the continuation of works: what does it mean? Have any other options been presented to the Board, including not continuing construction?

Mr Ursat

Hello, and thank you for your questions. Concerning your first point, the penetration welds will indeed be repaired on site once the robots have been approved by the ASN, so in autumn 2020.

Regarding detensioning heat-treatment process, as mentioned in our release of a few weeks ago regarding Framatone manufacturing, the four steam generators at Flamanville 3 and the pressuriser are indeed concerned. We have already transmitted extensive information to the ASN, allowing it to approve the start of hot functional tests with the steam generators. As at other French nuclear plants, we are currently reviewing the demonstration of quality and the qualification of these steam generators. We will continue to do so in the weeks and months ahead, in collaboration with the ASN, to which we are providing numerous items. This work is under way. As regards the steam generators at Flamanville, and those at other plants, we will be communicating gradually as the approval operations move ahead with the ASN.

Mr Laramée de Tannenberg, *Journal de l'environnement*

My questions have already been asked, so I will let someone else continue.

Charles X, *La Presse de la Manche*

Hello. Two technical questions. Why was the work in the space between the enclosures discontinued? Will a part of the facilities to be validated via hot functional tests be cocooned pending fuel loading?

Mr Ursat

Hello, and thank you for your questions. The scenario for the space between the enclosures is indeed the scenario that we have dropped, for a certain number of reasons. It was probably the most delicate scenario to implement. For those not fully familiar with the EPR, the reactor building has two containment walls, between which there is an empty space measuring around 1.60 m wide at the level of the penetrations. One possible scenario was to work on the penetration welds from this space, between two enclosures. Working in such a confined space required the development of a number of tools, manipulations and specific handling techniques, working close to civil engineering walls and in contact with sensitive components. Our analysis showed that this scenario had no advantages over the other two regarding scheduling and final quality and that it involved greater risks. So we chose to shelve it.

Once the hot functional tests are finished, the only thing that will remain to be done will be the finishing work, since the construction will be complete. We will have repair work on the secondary circuit and all the other equipment will be transferred to operations and will thus be in maintenance. This will be the responsibility of the operator of Flamanville 3, which will be in charge of maintaining correct operations, as is the case with a normal facility. The aim being that once we are ready to load, this process can be achieved in the best possible conditions.

Ms Jousselin, *RTL*

Hello. The ASN asked you to replace the reactor vessel head before end-2024. How will this be organised? If all goes well, will you be launching the EPR in 2022 and then stopping it to change the vessel cap?

Mr Ursat

We are currently working on this point with the ASN. We have launched the supply of the replacement vessel cap, which will be ready for end-2023 consistent with the ASN's decision. We are working with the ASN to determine how this will be done. If we are required to replace the vessel head, we will do so at the end of the first operating cycle of the Flamanville 3 EPR.

Ms Barbaux, *L'Usine nouvelle*

Hello. Two quick questions. You haven't responded to the question on the other options, the options of suspending work at Flamanville, if there are other options than that of continuing... I don't think I heard your answer.

Second question. I'm not sure I fully understand. You are carrying out hot trials. Will you do so again once the welds have been repaired?

Mr Ursat

Thank you for your questions. You're right, I forgot to answer the first question earlier. The Board of Directors has not formally reviewed other alternatives. Given the progress made on the work, which is now complete apart from the main secondary circuit and is now entering the hot functional test phase, and given the investments already made, it seemed logical to complete and commission Flamanville 3 so that it can produce an annual 12 TWh of electricity. The Board of Directors nevertheless had to be properly reassured as to the path we could follow to complete the commissioning phase. This is what we did yesterday, and what I meant earlier when I mentioned the support of the Board of Directors for the completion of the support and the achievement of the work on the indicated strategy.

At the conclusion of the operations, we will necessarily have a minimum number of tests to do before loading to ensure one last time that the facility is functioning correctly. We will be reviewing this point with the ASN in the coming years. We have the time to examine it. The test will probably be much shorter than the hot functional tests to be conducted presently. The major advantage of conducting trials today is that the facility is ready to be tested. As such, we will have an extremely clear view of the facility at end-December. The facility will be reputed as functional, subject to the repair of the main secondary circuit. This gives us a very clear view of the Flamanville 3 plant and enables us to correct any item revealed by the hot functional tests, pending the repair of the main secondary circuit, instead of having to observe items at the end. The main point is having a clear view of the plant. We will obviously conduct tests over a few weeks to verify the correct functioning of the facility, before loading.

Mr Spaes, *Nucleonics Week*

Hello. I would just like a few further details, since the question was asked earlier by Nabil about the steam generators. So, regarding the robots, you said they had been used at plants outside France. Which ones?

Mr Ursat

The robot we are working on as a priority for weld repair has been used at US plants. It was originally a robot from Westinghouse.

Ms Motte, *L'Opinion*

Hello. I have a finance-related question. You are talking about an additional cost of some €1.5 billion. Given the current situation, does EDF have the resources to cover that cost without calling once again on its main shareholder, the French government?

Mr Ursat

I do not have any comments to make on that subject. The sum of €1.5 billion was determined by EDF to implement the scenario to start loading at end-2022. It is part of the Group's financial trajectory for the next three years.

Mr de Beaupuy, *Bloomberg*

Hello. Just to clarify: do the 58 weld repairs include the eight weld repairs that are difficult to access and will be repaired by the robot?

Mr Ursat

There are 58 + 8 repairs. 58 secondary circuit welds outside the penetrations and 8 penetration welds. There are four pipes, since there are four steam generators conveying steam to the engine room. For each pipe, there are two penetration welds. 4x2 = 8 penetration welds + 58 welds outside the penetrations.

Mr Thome-Jassaud

Thank you for your questions. Thank you, Xavier, for your explanations. If you have any further questions, please feel free to contact our press office, which will do its best to answer them. Thank you everyone. Have a good day. Goodbye.

Speaker

Ladies and gentlemen, the press conference is now over. Thank you for taking part. You may now disconnect.