

Rick Boyle.

Our last speaker this morning is Dominique Mockly. He's a senior executive vice president at AREVA. Dominique Mockly has served as Senior Executive Vice President, the backend business group for AREVA since 2011. He was Executive Vice President of the Avionic and Optronics Division of SAGEM Group from 1998 to 2003. He joined the AREVA Group in May 2003 and was appointed Chief Executive Officer of AREVA, TA, a subsidiary of AREVA dedicated to Naval propulsion and complex industrial or scientific programs.

In 2009 he was the Senior Executive Vice President for the International Development of AREVA and in January 2010 he was appointed Senior Executive Vice President, International and Marketing for the group. In 1995 he joined the French National Defense Secretary as Director for Defense and Economic Affairs. In 1997 he was appointed Special Advisor to the French Armament Director. He joined the private sector in 1998 and he is a member of the AREVA Group Executive Committee.

In addition, he has been Chairman of the Board of Ecole Nationale Supérieure des Techniques Avancées since 2007. Please welcome with me Dominique Mockly.

Dominique Mockly.

I'm very pleased to be here with you today. And to be one of the members of the stable at this Patram exhibition. In the backend activity, it has 10,000 employees, two billion Euro turnover and its dealing with used fuel management solutions, waste management solutions, D&D and all these activities cannot be done, either there is not logistic packaging and safe transportation. So we count on you just to allow it to happen and our 10,000 employees need you. And it's also the reason why we have included the logistic into the backend. It does not mean it does not serve the rest of the group, but it serves the backend and it's a key for that.

My speech today will be organized into three parts. First, I will come back on some events that happened since the last Patram. Then I will just emphasize what it implies for us. And then I will tell you how we cope with it or try to cope with it in AREVA. At the end of the speech because it will not be too long, but I want not you to sleep in it, I have brought in a small movie. This movie is in French and in English. I know there is a debate today or a discussion between the European Commission and the U.S. regarding exchange, etc. and in particular on the movie problematic so I tried to have something which is European but also U.S.

So let's go now to what changed since the last Patram. Plenty of things have changed, in particular in some regions or some countries, but I just focus on

three topics: Fukushima, continued economic down, and some low energy prices.

Regarding Fukushima, it focused us in particular in the fuel management solution and the one that sometimes are used and still used regarding for example, what do you do or what the operators do with the reactor pools. If it's clear that reactor pools cannot be seen today anymore as a solution to store on the long lasting solution, the spent fuel.

Continued economic turndown just implies that sometimes, and it's linked with the low energy prices, our customers, utilities, have to shut down earlier than foreseen ... And with that the first topic that is dealing with this shutdown of a plant is the spent fuel management.

Regarding Fukushima, the additional topic that is important for us to notice is that we have now additional safety constraints. It's linked with the spent fuel but not only with the spent fuel. You have a pressure that is coming from the public opinion and from the regulators to solve issues that you didn't solve before. So you need not only to see to what happens now but also to see what will be the final solution for a certain number of problems.

So you see from these three elements it implies for our customers uncertainty. Most of them, they don't know exactly how they will deal with all of that. And for us it implies safety additional constraints for us and for the customers. And a sort of feeling of urgency. So when we are speaking of solutions in 30 years from now, I think today we have some pressure which is a different pressure than the one we had I think three years ago, solving issues that need to be tackled in order that we recover the situation where nuclear can be developed again.

So I would just end this saying the other element which is key when you see that you have low energy prices and continued economic turndown, you have more constraints but you also have less money. So it means that you need to be innovative and to find proper solution to address the problematic of your customers.

So when it's the situation in which you are then this context what should be our priorities? The first one must be international cooperation. Why international cooperation? Because the solutions, you have a certain number of countries they cannot apply to other countries. And when you have financial constraints, it's sometimes easier to find easiest and simplest solutions than the ones that are implemented in a country, where up to now no financial constraints were applied.

Then we need also to sync to optimize long term mutual management plans. It's essential for the credibility. It was already essential in the past but today according to what happened in Fukushima, it's a key question. What will happen with this used fuel management in the future?

And then for you, safe and secure packaging and transportation of radioactive material is a priority. Keep the ... flowing. What we want really is to maintain the safety records that we have up to now and continue to demonstrate that what we have done up to now is viable and is good for the future. So if we focus on these three priorities, I think that in the situation where we are we can tackle the present and we can prepare the future. Because the future is positive. If you look at what could happen in 2035, we still have anticipation or the anticipation of a growth of 50% of the nuclear industry. It's felt that it's not exactly at the same place or in the same area that it was in the past. But you see that China will become one of the big players in nuclear with a lot of big fleet installed and unfortunately I think that in that time you need to have more Chinese coming as well as more Indians and probably thank you for our Russian colleagues to be here. You see that in 2035 what we are doing now will be a key solution for this period of time and we are, however, very optimistic about the fact that it's what will happen even if today some science may be pessimistic.

So how do we think we can do it ... The international cooperation, among the people that are higher and I think Patram is a good thing just to continue and to try to exchange all this information. We have tremendous experience. We have worked during 40 years. We have developed a lot of solutions. We have research programs funded by the OE but also funded by the others in various countries. We need to share all of that in order to have the best solution for the future.

We need to develop common standards. We need also to recognize the best practices of everybody and share them, probably better than what we do today. And we need, as you said, we have sometimes difficulties to educate people. Really need to develop common public education. I always, I'm responsible for the transportation in France and we have roughly 7000 transportations a year. I'm always surprised the way people just imagine what we are doing. It's extremely difficult to make them feel comfortable with nuclear waste or nuclear fuel transportation. So we need to work all together in order to make them understand that what we are doing is something which is safe. It has been designed to be safe for us and for them. And today clearly we are not the best so it's why I want to share all of that with the others. We are ready, however, to share our experience on that, to build working groups, to exchange experience and it's really a topic we need to tackle.

With that then the second topic which is how to deal with the fuel inventories and project ourself in the future. So you see on this diagram that if we project ourself in 2030 we'll probably double the used fuel inventories. You have in the first column the used fuels annual unloading. In 2011 is typically 7000 tons of heavy metal which is unloaded every year. And if in 2013 the fleet is what it is forcing today, it will be 12,000 tons. So all you can explain to the public opinion that you don't have a sustainable solution to consider all the spent fuel, how will you be able to develop nuclear in the future if you don't have these solutions. So it's why and I would come back to the two solutions that still exist today.

There is one which is considering the used fuel as a waste and the other one which is recycled material. I just stop on that a few minutes.

I think we have two solutions to consider. There is an urgency because today for example you have a certain number of customers that wants to have solutions in order to demonstrate that they have a long term solution for all their fuel. And for these customers all is good. Today you can either have dry storage for example, but you can also recycle leaked fuel if you want. So all the fuel is not always considered the same way. the best is to propose the best solution today in order to treat their utilities to solve their problems.

But globally so you have a tactic which is a two day commercial approach we are doing with our customers to help them solve the problem they have. A problem which is put to them from their regulatory agency or from their shareholders. And you have the long term strategies.

On the long term strategies it is clear there are two options. The first is to consider used fuel of the waste. The other one is to recycle. In France we have decided to recycle. Japan has also decided to recycle. There are some data which are not very well known. So I would just clear it a little bit for you. In France we recycle just for EDF 1000 ton of spent fuel a year. With the spent fuel we manufacture 120 tons of mox and it allows not to have plutonium in stock. So we do not increase the stock of plutonium, it's just recycled and its mox and then mox gets included in the fourth generation strategy. This fourth generation is under development via the ... program.

So this is this type of strategy which is implemented in France and those who say that we are increasing our stock whatsoever, it's not the truth so what we are doing is really just treating the fuel and using the recycled material in mox.

So these are the two strategies which could be implemented. In order to allow these two strategies to be developed there are programs under development in order to increase the recycling capacities. These recycling capacities for



example in China we've signed this year a letter of intent in order to develop a recycling facility in China in order to prepare this large fleet that will be developed in China.

It's clear that interim used fuel storage solution is also a solution as it's implemented in the U.S. today. But for us what is key, and I think it's what we need to keep in mind that these used fuel management solutions even if it's implemented, it needs to have a clear output and the clear output is what type of disposal. And as long as we will not be able to explain to the public opinion what is the final disposal solution, then we will have a problem.

And the third element which is key for us and as I said is to prepare safe and secure nuclear logistic. To continue to invest into safe, secure and nuclear logistic. When you operate a plant, you know all of that, the first safety issue the reactor itself. But the second one is the used fuel, either in the pool or in the [undling]. When you manage your spent fuel this is the second most critical activity you have in your plant and it's something I do every day so we are managing spent fuel in our ... plants every day. I know that all of that is extremely critical and it's critical also for the utilities.

So we have developed and we continue to develop R&D programs and training programs in our company in order to work on them. What we are doing

is to capitalize on our 50 years proven experience to put as a first priority safety. And to push a vision within the company in order to present a solution that could be the solution for the future. And it's where the movie comes and in order to present to you what we consider could be the vision of the future, we have developed one product. This product is called the TN Nova System. It's a system we developed for expo in Switzerland and we developed it in cooperation with NRC so it's really an international program which is for a European utility but under NRC regulations and co-developed by a team in France and a team in the U.S.

So let's look at the movie please.

[video plays]

So I think that thanks to this movie you just recognize a little bit what you are doing every day.

So as a conclusion, it's clear that the situation in which we are today is a little special. After the Fukushima event and according to the economic situation that there is worldwide. But it's clear that to come out of that we still need to emphasize and develop our high industry standards and try to do it for all. It

means for us, for our customer, try to optimize all of that. It's key for the public acceptance.

The other message is that I wanted to give to you is that even if you do that, we and I think also our administration and the politics in our countries, they really need to emphasize, to define clear, backend fuel cycle issues. Could be a recycling, could be considering spent fuel as waste, it's not a problem. Must be clear and it must be one of the key questions for the future and for all developments. Thank you.

Rick Boyle.

Time for questions. Then you've left the time for me. I will mention because I may run on in questioning or answering, Secretary Lyons needs to leave at 12:30 so I wanted to make sure he knows we thank him for participating. It was an excellent presentation and if you want to catch him on the way out or ask a last minute question, I wanted to give you a heads up.

You're the second presenter, we had one yesterday, that said we need to do more to reach out and get, I don't want to call them developing countries, I think you said it better, in countries that are growing their industry, to participate both here at Patram and my experience would also be at the IAEA. What advice do you have? We've laid out chairs for them but they didn't come. We

put it on the web but they must not have read it. IAEA I believe has the same fate. What's your advice? What do you think we could do?

Dominique Mockly.

I think the next time just do it in China.

Rick Boyle.

Mac and Japan might have a question of that. Writing that one down. Now we know why he's in charge.

The other aspect that came to me and I don't know if it was in your presentation or on a website, but if it takes three years to design a cask and two years to build it. And I don't know if any of that includes the approval with the NRC and DOT or any other authority. And the IAEA wants to be on a two year revision cycle and they want to risk inform their regulations, how are you planning for regulatory stability or how do you make any long range plans when everything can change?

Dominique Mockly.

It's a very difficult question. In fact we have an initial planning and we review all planning very often. And it's one of the issues for our customers and also for the type of engagement we can take with them so this is risky. I think it could be

really important if the regulatory authorities could converge on a certain number of methods. To date it's clear that we have to handle each of the safety authorities the way they work and we are keen to doing that. But it's clear they do not work the same way, the one and the other.

I would guess very small synergies on the type, methods and the way they license new products than it is today. I would dream of what happens in the aeronautical world in which I was before where in fact I get a license which is an international license, even if I get it from France it's recognized everywhere in the world which is sometimes the case, sometimes not. But for that I really believe they need to work much more the one with the other. Even if they work, but it does not converge to the same type of standard or same type of methodology.

Rick Boyle.

Any other questions?

Question.

[David Blee] Dominique thank you for an excellent presentation and coming in for this, and the same with our other gentlemen on the panel, and Rick as well.

One of the points I noticed was the increasing inventories and again this understands the increasing concern we have over the stalemate on the

backend here in the U.S. Right now we have about 70,000 metric tons in inventory. By 2030 it's going to be 100,000 metric tons. By 2048 it's going to be 150,000 metric tons. And just to move that even at an ambitious rate would be 50 years. And an unambitious rate would be somewhere around a couple thousand metric tons a year, 75 years. I don't know there's much of a response necessary here, but I want to thank you for illuminating that issue.

And I'd also like to say that I believe you were traveling in yesterday, that a lot of your themes actually illuminated a lot of the themes that we elevated yesterday as well in our first session. So thank you very much for your presentation. And thank you to all of our distinguished speakers today as well.