Insights from Leaders in Nuclear Energy: Leadership for Safety

Hans Wanner, Director-General,
Swiss Federal Nuclear Safety Inspectorate (ENSI)

Mike Harrison, Chief Nuclear Officer,
EDF Energy

OECD
BETTER POLICIES FOR BETTER LIVES

NEA
NUCLEAR ENERGY AGENCY

Insights from Leaders in Nuclear Energy: Leadership for Safety

Hans Wanner, Director-General, Swiss Federal Nuclear Safety Inspectorate (ENSI)

Mike Harrison, Chief Nuclear Officer, EDF Energy

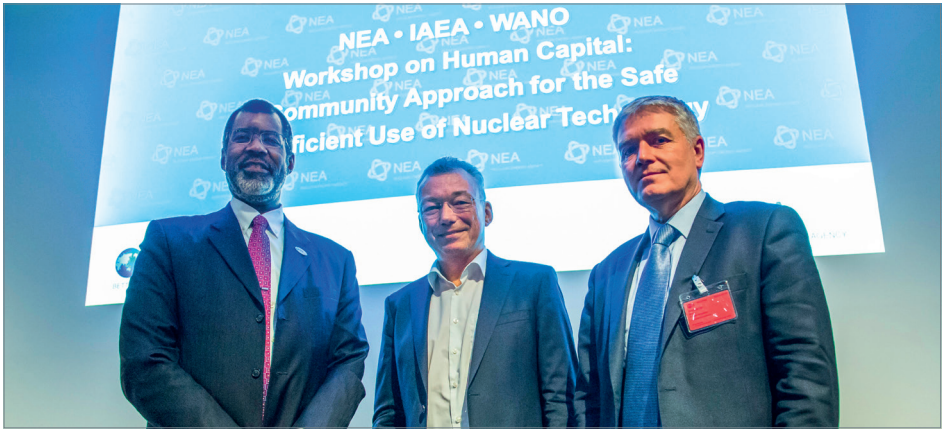
In conversation with William D. Magwood, IV, Director-General Nuclear Energy Agency

5 June 2019

The mission of the Swiss Federal Nuclear Safety Inspectorate (ENSI) is to regulate the nuclear safety and security of Swiss nuclear facilities. Hans Wanner joined ENSI in 1995 as a geochemist and was appointed its Director-General in 2010.

EDF Energy is the United Kingdom's largest producer of low-carbon electricity and a subsidiary of the French state-owned Électricité de France (EDF). Mike Harrison was appointed Chief Nuclear Officer for the EDF Energy Region 1 fleet of nuclear power stations in January 2018.

Nuclear Energy Agency (NEA) Director-General William D. Magwood, IV sat down with Director-General Wanner and Chief Nuclear Officer Harrison during the NEA-IAEA-WANO Human Capital Workshop in June 2019 in Paris for a wide-ranging discussion regarding leadership and nuclear safety. The conversation touched on influencing behaviour, feedback culture, transparency, public communications, and the relationship between the regulator and operator.



Director-General William D. Magwood IV: I have often made the remark that, in the post-Fukushima Daiichi era, we have done extensive work to improve safety across the world. We have added equipment, procedures, and training, and the plants have never been more resilient than they are today. I think that everyone would agree with this. It is difficult to imagine, other than because of a major natural disaster, how a plant would develop a significant nuclear safety problem unless someone, somewhere does not do his or her job and do it correctly. So it comes back to the human aspect.

All of us have studied the famous three accidents – Three Mile Island, Chernobyl, and Fukushima Daiichi. It is remarkable how each one of them has a significant human aspect that either led to the conditions that allowed the accident to happen, or created the accident itself. Human engagement played a large role in each of them.

I will start off with a story, because when I was reflecting on this, I remembered an issue which came up at the US Nuclear Regulatory Commission (NRC) several years ago. We were considering whether to follow the example of many European and Asian regulators and require filters on vents for some containments. This is something that Switzerland did a very long time ago in response to Chernobyl, and many others have done in response to Fukushima Daiichi. In the U.S., this was a major debate. For small containments, Mark I BWRs, if there is an incident where pressure builds because of a severe accident – just as we saw in Fukushima Daiichi – it is the responsibility of the operators to release the pressure by venting the vessel. This is the established procedure and is essential to protect the integrity of the containment. The linchpin of the NRC's debate, however, centred around whether the operators would actually follow the procedure. Or, being human, would they consider what was happening outside the plant-whether or not people had been evacuated?

Procedurally, operators are not supposed to take factors such as the outside environment into consideration. But when you look at the situation from a human perspective, as a human being they may worry about what is happening outside and delay venting, which could lead to a bigger accident. It is a very human question, and these are the kinds of decisions that we expect our nuclear operators to be able to make at many junctures.

This leads me to a proposition which I find quite interesting, that "regulators are supposed to influence behaviour." When you think about these issues from the perspective of a regulator, how do you influence the behaviour of an operator to be sure that they make those tough decisions? What is your role as a regulator in influencing behaviour, and how do you do it?

Director-General Hans Wanner: A regulator influences the behaviour of the operator by setting the example. This is very important, and that is why it is key that the regulator has a strong safety culture – not just the operator. It is fundamental for the regulator to work on its safety culture. Earlier, this was considered as something for the nuclear power plant operator exclusively, but I cannot stress enough that as a regulator we need it as well, and at the same level as the operator.

I would also like to respond to your story about the filters. I find it quite interesting that you mention this. You cannot necessarily improve the safety of the plant, but you can certainly improve the safety of the population around in case of an accident. I think this is one of the examples of how to upgrade nuclear power plants and to think about the goal of the upgrade: It is the safety of the population above all. Of course, we must always address the question of reasonable practicality. What is reasonable to request from licence holders in terms of investments, not only for maintenance, but also for safety upgrades, for bringing the safety features of the older nuclear power plants closer to the safety levels of the new reactors?

What we have learned is that improving safety is a continuous process, and safety upgrades are determined in every periodic safety review, with the safety systems of the newest nuclear installations as the reference point. While we know that the old plants will not be able to achieve the standards of the newest, we can look at that gap and determine how reasonably close we can bring the old plants up to that level.

Influencing behaviour

DG Magwood: Let me ask Mike to respond to this as well, because regulators may ask operators to take certain actions which may be counterintuitive from a human standpoint. If someone has to make a tough decision, what is the kind of training they receive and the type of environment that you strive to create to make sure that the right decisions are made?

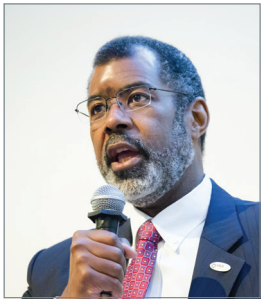
Chief Nuclear Officer Mike Harrison: I would like to give a few examples if I may. Looking at these issues from the engineering standpoint first of all, a few years ago we had a problem with one of the reactors at our Heysham site. When the engineer came forward to say, "I think I have a problem," at that point, it is about how we respond as an organisation. You can go into denial; you can ask for more information; or you can shake the engineer's hand and say, "You have done your job to the best of expectations." That sends a very strong and powerful message throughout the whole organisation

that you value nuclear safety; that you value professionalism; and most importantly, that you value initiative. When people are prepared to come forward very early on with a little bit of information to say, "I think I've seen something which is out of the ordinary," it enables the organisation to respond. That decision at Heysham ultimately led to four reactors at two of our power stations being shut down for more than a year, but the individual did the right thing in coming forward with the team supporting it. It enabled us to put a new infrastructure around it for recovery.

The second question is, how do I know that the operators will respond correctly per procedure? I believe in practice. We practice emergency schemes at the power stations, and this makes the response when you are in a real situation that much more ingrained in your behaviour. I have been in the industry a long time, and unfortunately I was the emergency controller of a site incident. Just describing the emotions you go through when you come to the site and you see the flashing lights, the fire brigade, the ambulances – you see the whole infrastructure in place, and you go to the emergency control centre to take your first steps. The first thing that you go through is the steps of your training. Get the facts, understand, and make the decisions as you go forward. Now I think that practice gives me the confidence that everyone will perform their role. The way in which individuals integrate into a team in that emergency control centre, and share the learning and experience, enables you to do that.

The last example I want to introduce is that your learning never stops. The power and energy which is contained within a nuclear reactor is such that, no matter where you are in the organisation, you need to completely assimilate and associate that understanding and be aware of what your role is. Recently as part of the World Association of Nuclear Operators (WANO) Chief Nuclear Officers (CNO) Forum, we met with CNOs in Japan to visit the power stations and the Fukushima surrounding area and see what 5 000 people are working on. Eight years after the event, that brings all the emotion back. For this reason, we are focused on giving all of our operators that experience. We have taken some of our shift managers to Chernobyl. It is our duty to provide that emotional context around the reason for procedures and behaviour, so that it cascades through the organisation. It is part of what we are. It is our responsibility not to forget the three events and to constantly live them.

Feedback culture



DG Magwood: Let me ask you to react to what was said a few minutes ago regarding the example set by the regulator. How do you see the nexus when it comes to motivating people to have the right behaviours, to take the correct action, and to have an understanding of the environment in which they operate? How do you see that nexus between what you do, and what the regulator does, in terms of galvanising behaviour?

CNO Harrison: When looking at the problem, identifying the goal that we want to achieve enables and encourages the wider organisation to see the problem that we are trying to

resolve. When it becomes prescriptive, then I think it drives a culture of "we will respond to what the regulator says," and just deliver that. In that case, you are not engaging to resolve the problem that has been set. You need to look at what is the best solution for that particular reactor in that specific situation to safeguard the entire range of scenarios that exist – from a small release to a Fukushima- or Chernobyl-type mess. My view is goal-setting, rather than prescription.

DG Wanner: I fully agree that as a regulator we should not be prescriptive. With regards to what we nowadays call our safety culture – or oversight culture, to distinguish the safety culture of the regulator from that of the operator, because they are distinct – we really do pay attention to the effect that our behaviour has on the operator. In order to steer that behaviour, we have a feedback system with the operator. It is very important to have an effective feedback system. We used to rely on feedback forms, in which every regulatory decision we issued would include an impact form for the operator to fill out and return to us. More than 90% of the feedback forms returned did not indicate any problems. Only in very rare cases, where there had been delays caused by us, for example, would the operator indicate dissatisfaction. However, we decided that this system was not sufficient for us to learn enough from our regulatory work.

So, we decided several years ago to have impact assessed at different levels. For example, at the top management level, we have annual meetings with the heads of our operators, and one of our agenda items is "feedback from the operator to the work of the regulator." That is where we learn many things. We collect all of this feedback from the year and it is further discussed in our closed, two-day meeting of the regulatory executive board. We then decide on measures to improve the situation. And the next year we give feedback to the operators, and the whole process starts again. This top-level feedback loop has been going on for several years, and last year we started the same process at the technical level. This has been quite successful, so we are in the process of establishing a continuous, ongoing process. I hope that these multiple feedback loops at the management and technical levels, in addition to the formal feedback form, will improve our ability to learn.

DG Magwood: So this is a mechanism for the operators to give feedback to the regulator regarding their perceptions of oversight and your function as a regulator. How about internally? Do you have methods for soliciting feedback on your leadership from managers, inspectors, and other personnel?

DG Wanner: I am not sure if I have totally succeeded in this respect. We have regular management meetings, and I have an informational meeting with all staff once a month – it used to be more often in the period right after Fukushima. The all-hands meeting is an opportunity for everyone to ask questions and give feedback. However, it is not used much for that purpose, because the group is too large – more than 100 people. You need a special personality to speak up in a large an audience, and also as a leader you need a certain outlook to receive this feedback. This is where we get into how to behave as a leader, and it is something that we are working on. It also relates strongly to social competence, which I believe is ever more important. Technical competency is of course essential, but if you have a technical person with insufficient

social competence, it is not so easy to work with him or her – and this impacts knowledge transfer as well. For example, retiring staff are supposed to transfer their knowledge to the next person. Sometimes this works very well – other times, not at all. When a highly competent specialist is not able to transfer his or her knowledge, whether orally, through demonstration, or documentation, it may often be due to insufficient social competence.

DG Magwood: Mike, I would like to hear your thoughts on feedback culture.

CNO Harrison: Regarding feedback culture with the regulator, if I went back 20 years in the organisation, our relationship with our regulator was not good. We fought over many detailed issues, and it was reflected in our performance. We lost the trust of the regulator, and to a certain extent we also lost the trust of the public. I remember we had a workshop with the regulator which was heavily facilitated. The facilitator previously worked on the Irish peace process, so that tells you something! It was the start of something really good. It was fundamental. We understood that our perceptions were different depending on whether we were the operator or the regulator, and it enabled us to identify a common goal and behaviours, which do diverge from time to time. Ever since then, we have continued to have regular facilitated workshops as a fundamental part of our culture to create a safe environment where we can come together and speak openly about our observations and concerns. This method has helped us to reshape our relationships through different levels of the organisation. In addition, EDF Energy uses a set of questions to gain insight as to how exchanges can be better facilitated.

The organisation's internal regulator meets independently with the external regulator the Office of Nuclear Regulation, ONR to share concerns, and these meetings are not attended by operational staff. Nor do I, as CNO, know what is going to be said in those conversations. The feedback is usually well-aligned, and it helps us understand where we are headed as an organisation.

Internally, we have the standard feedback loops. With our partners, every two years we conduct an extensive survey, in which safety questions are included. This allows us to observe trends among stations, and within stations by departments. Where there is a decline, we can go in and remediate it.

Safety and transparency

"The only way to build trust with the regulator as well as the wider community is to be open and transparent."

DG Magwood: Some within the industry suggest that we talk about safety too much. Has the nuclear industry, in trying to promote safety, created an environment that scares people?

CNO Harrison: We still have a duty to open our doors and be transparent. In the 1990s, we closed our visitor centres. They were costly, and the view at the time was that they were stale, and that the public knew who we were. However, as part of the reinvention and drive to improve our organisation, we reopened them in the 2000s, and encouraged people to come into our power stations. We talk about

safety when people come onto our stations, but that does not mean that we scare people. Using the metaphor of an airplane, reviewing the safety procedures does not mean that the plane is going to crash, but rather it instils confidence that we know what we are doing. Interestingly, our visitor centres are now listed in tourist guides as a local attraction. In this way, we engage not just our immediate stakeholders, but also the broader community. Local residents in the vicinity of nuclear power stations are the most vociferously pro-nuclear. We have a responsibility to talk about the "what-if" and what we are doing here, and its significance. The only way to build trust with the regulator as well as the wider community is to be open and transparent.

DG Magwood: So if I understand correctly, you do not believe that you can have an external message that deemphasises the safety message while also having an internal message that emphasises it.

CNO Harrison: That is correct. For example, the graphite core of our current fleet is going to determine the length of service. It is aging, and we cannot replace the graphite. Putting out a video and pictures and explaining the situation has reduced tension with the community. We have an onus to speak openly. We will shut some of our power stations in the not-too-distant future, and it will be the graphite core that determines that. With that in mind, we should not just suddenly surprise the public, and when it does happen, we should talk about it. While we have undertaken a phenomenal amount of work with research institutes and the like, we should be open and transparent about what we are finding, and where we are going with that. That way ultimately the public can have confidence in our decision-making. That is the feedback we are getting from those who are observing what is going on.

DG Magwood: Hans, the job of the regulator is supposed to be primarily focused on safety. Yet at the same time, other realities come into the conversation. For example, regulators are conscious of economic considerations, even if they theoretically are not supposed to worry about that. In addition, the regulator plays a role in public perceptions of nuclear power. There are pressures as well for further innovation within the industry,

including to enhance the safety of plants, or for fuel, for example. And it is good that regulators encourage innovation. So with all of those considerations in mind, how do regulators reconcile these factors with safety? Is the conversation with licensees about safety straightforward, or complicated?

DG Wanner: It is straightforward, because the operators know that we have to focus on safety and on continuous improvement. In Switzerland, the government, parliament, and a clear majority in direct referendums have all decided on the phase-out of nuclear power, so there is no question about that for the moment. However, there is the question of how long the plants will operate, because the licence holders have unlimited operating licences. Non-governmental organisations continue to press for an answer on this issue. I think that a nuclear power plant can operate for as long as the licence holder is willing to invest in the safety of the plant. Of course, there are important issues surrounding aging, especially for our older nuclear power plants, such as embrittlement of the reactor pressure vessel. There are certain limits, which are reflected in our regulations and even in our legislation. We know that our oldest plants will not reach this limit until at least 60 years of operation.

The relationship between the operator and the regulator

"The regulator must have confidence and trust in the operator, which requires a good relationship."

DG Magwood: I am very interested to compare how Switzerland handles these considerations on a case-by-case basis, which is very different from the U.S., where the process is designed to make everything as quantitative as possible. Moving on, however, as you have these conversations between the regulator and the operator, there is a lot of contact. Independent

regulation does not mean isolation, and regulators engage in rich discussion with licensees about upgrades, operations, the future, and many other issues. How do you draw the line so that you avoid becoming inadvertent consultants?

DG Wanner: Engineers working for the regulator and the operators engage with one another as specialists and even share a similar culture, and so it is natural that they feel comfortable with each other. For that reason, we have to remind our staff that they are not supposed to make suggestions to the operator, nor recommend any particular solutions. It is a delicate balance, and ENSI has to consciously work to maintain appropriate awareness of the boundaries while staying in good communication with operators. A healthy relationship between the regulator and operator is important; too much distance is not productive. The regulator must have confidence and trust in the operator, which requires a good relationship. Of course, we do regular inspections, and if we think that an operator is not performing correctly, we pay closer attention. In addition, to support a culture of regulatory independence, our specialists interact with the operator and conduct inspections in teams. If a team member becomes too close to the operator and regulatory capture begins to occur, the other team members can spot it and correct it. This is an added dimension to why it is important that all the members work together as a team. And the team only works if the individuals on the team have a minimum level of social competence, so that they can communicate well with one another, understand each other, and give and receive feedback in a supportive and constructive manner.

CNO Harrison: There is no line with regard to nuclear safety, but rather it is a journey of continuous improvement. Across the world, different approaches flourish: for example, the Europeans want to resolve problems at the design level, whereas the U.S. wants to raise regulatory and operational standards. In truth, you need to marry the different approaches together. What is important is for operational excellence to drive safety performance to a higher level, and to look continuously at how you can improve. The challenge is to start with the problem, rather than a prescribed solution. Utilise the capabilities within the organisation to address the problem at hand; it is not necessary to spend phenomenal sums of money coming in with a prescribed solution.

DG Magwood: Talking about the relationship with the regulator, in the UK you have a very engaged regulator. You said earlier that if the regulator is prescriptive, you may react to what the regulator wants, rather than taking actions to address the root of the issue. Where do you see the boundary line between what the regulator is trying to accomplish, and what you are trying to achieve within your own organisation? Is there a point at which you feel that the regulator can be too intrusive and too involved? Or do you think that you have found a good balance?

CNO Harrison: I am sure that my regulator would agree that there is not a perfect answer to that question. Prescription comes about due to a lack of trust in what the operator is doing. If you have a safety case or a particular problem that is not getting resolved satisfactorily, or if the trust barrier is breached, then the natural human reaction is to intervene and to challenge more directly. That then becomes a vicious circle, and you end up with prescription at the end of it. If, conversely, there is an open, transparent, and effective response, then it can be a positive cycle, and becomes more enabling. There is not a direct point in time where you can say that you have mastered the situation and have a perfect relationship. Like all relationships in life, you have to work on it continually in order to get the most out of it. If you become lazy, or overly confident, then the relationship deteriorates and you lose that trust. I am not answering your question directly, because I do not believe that there is a line, but I hope that I am providing insight that while the relationship with the regulator can be very good, it will fluctuate depending on the specific issues that we are dealing with, and the performance that we put in. It is an open book.

DG Magwood: How does the conversation between the operator and regulator about safety culture differ from more straightforward discussions of strictly technical issues?

CNO Harrison: We have a structured series of meetings with the regulator. We call them Level 4, Level 3, Level 2, etc. It is set in a hierarchy, in which issues are elevated. It is not usually the technical issues that get elevated, but rather the behavioural ones. So, for example, if we have a working level meeting at Level 4 and there are differences of opinion and people are becoming fixated on certain challenges, rather than letting it become protracted and intractable and people becoming more and more entrenched, the issue is

elevated to Level 3. Then the issue can be discussed immediately. It will not be debated at the detailed, technical level, but rather with regards to whether we are providing sufficient evidence and whether behaviour is becoming entrenched. Then if it comes up to Level 2, the director level, we see some of the core themes that need to be addressed. Ultimately if it reaches Level 1, it will be a one-to-one meeting between the chief inspector and the chief executive, and they will establish where the direction of the company is going and whether we are seeing variation from that. I think it is important that we have this escalation route. It is not a problem if individuals within our regulator, ONR, or within our industry disagree on certain points. What those disagreements should not do is cause huge disruptions or silo thinking, which in the past may have happened.

The changing role of public communications

"I realised that by becoming a regulator, I was the one responsible to the public for ensuring safety, and that the public was relying on me."

DG Magwood: Let me back up for a moment and ask a few broader questions. How has your view of nuclear safety evolved, and how do you think your role as a leader has evolved?

DG Wanner: For me, the most significant change in my perception of safety occurred when I joined the regulator in 1995. I became very aware that I was a regulator now, and that my role had just become very different from what it had been before. To adjust to this new situation, I became very intentional about changing my perspective to accommodate the new responsibilities that I was assuming. I realised that by becoming a regulator, I was the one responsible to the public for ensuring safety, and that the public was relying on me. The public wants to know that the regulator is independent and is doing a good job. Communicating this message to the public has been the most important development since I became director-general.

When Fukushima occurred, I had been director-general for just six months. The existing communications strategy could not handle the scale of public interest in Switzerland, and we were quite overwhelmed. As the nuclear regulator, we were questioned and scrutinised by the media and by national politicians. This necessitated rapid changes to the communications strategy. The greatest challenge was how to communicate what we were doing, so that the public could trust our activities. Public communications is quite a lot of work! Our communications team consists of five people, and in addition, we need input from the technical staff, which was difficult in the beginning. At first, the importance of dedicating time to public communications was not self-evident to the technical staff. Public inquiries from press or politicians typically have short timelines, which can be quite demanding for staff with other primary responsibilities. It was a challenge and took a lot of effort and informational events to explain to staff why they were being asked to dedicate resources to public communications, and the benefit to the regulator and to the public of doing so.

CNO Harrison: I want to add to Hans's remarks that the single most explosive change that has happened in my career has been in the realm of communications. Just looking at social media, the speed of information and response has greatly increased. If an ambulance is called to one of our sites because someone falls ill, for example, it will be known about throughout the local vicinity before the ambulance has even arrived on site. Therefore, how you respond, and how you set up the communications framework is fundamentally important. Despite all the practice that goes into emergency simulations, on the communications side, the exercise is minuscule compared to what would happen in even the smallest of actual events. If you have a Greenpeace invasion at a site, for example, within an hour you will have four or five national media stations and 30 or 40 journalists on site. The communications team cannot be an afterthought – it must be the root and branch of all activities. So we need that openness and transparency, and we have got to get that professional coaching and training in communications. In addition, the communications strategy must consider multiple technical and non-technical audiences, and appeal to those who are experts and want answers to technical questions, as well as those from the general public who want reassurance. This is a huge change, and to my mind the one area where the regulator and operator should work together and have a joint communications strategy. Knowing who is communicating what can assist enormously.

DG Magwood: I agree with both of you. At the NEA, we spend a lot of time talking about public communications. How do you even talk about radiological risks with the public? It is a difficult conversation. While the ideal is to educate people in advance, the reality is that most people do not care to hear about nuclear technology issues until something happens and they are already angry and afraid. Therefore, public communication is a key issue for the industry and for regulators as well. In my view, it is always important to remember that at the end of the day, the regulator is a public servant. It is part of the job to answer the public's questions. How do you take these very complex, technical issues and communicate them to the public in a way that is useful? That will be an ongoing struggle, and nobody does it flawlessly. The effort must be put forward, however. As we come to the end of our discussion here today, could you share with us your personal visions as leaders, including what you aim to accomplish?

CNO Harrison: The role of leadership is to be a servant. My goal is to dedicate my time to supporting and achieving excellence through the individuals who are operating the power stations, and that is also where I get the positive reinforcement that things are going in the right direction. For example, I was filled with pride when I visited Heysham 1 power station last week, which is facing many of the challenges that we all face, with an ageing workforce. Recently, the plant had to perform an exchange of the nozzles of the fuel machines, a complex procedure which had last been performed by staff who had already retired. I met with the unit and walked through what they had achieved. The team lead was 27 years old, and of the 15 team members, the average age was 30. None of them had performed the task before. However, as they went over the quality plans, the procedures that they had updated, and the operational experience that they drew in, they had pulled it all together and the project was completed uneventfully. The performance of the team unit was the best that it had ever been. The way in which they were supporting each other, being humble, recognising the wider support of the organisation, and the way in which they had linked up with and communicated with personnel at the centre and at other stations demonstrated how well they had managed it. It was a perfect example of knowledge capture.

I felt at that moment in time that this was a major step in what we are trying to drive through. Any way that I can facilitate that, by sitting and listening, that is my role as a leader. In the past, I made the mistake of being too directive. My "ah-hah!" moment is to look beyond the surface, to encourage and to support. The younger people coming into the nuclear industry will take it to a new, higher standard. Overconfidence makes me nervous, but I feel comfortable when I see the humility of the new generation leveraging on everything they can possibly do to make sure that the job is done efficiently, and document it, and institutionalise it. Our so-called experts of yore have sometimes not captured things in the right way, which our new generation has taken on board and is working in a far more consultative, proactive, and cross-functional manner than perhaps was done in the past.

DG Wanner: Modesty and humbleness will take you far. What I have not yet accomplished is to achieve a resilient organisation as a regulator. More social competence in general is needed in the organisation, including a greater ability to work in teams, to transfer knowledge, and to welcome newcomers. While technical skills are the basic starting point, in the end it all comes down to social skills. When recruiting staff in Switzerland, they are coming into a phase-out situation, which can be difficult. The Swiss regulator is criticised perhaps more often than those in other countries, because operating licences are not time limited. This places more pressure on the regulator to determine whether the plants are safe. So in light of this public scrutiny, it is even more important to have a good professional and social environment within the organisation. In addition, the staff has been reduced because the first power reactor will be shutting down later this year. Our people will have to become more flexible. We still have silos. We must do more rotations, and further embrace learning. Resilience is key.

Reflecting on the past, leading forward into the future

"Celebrating drama and crisis management creates a reactive organisation. I wish that I had sought out and better rewarded the "boring", safe, sustainable, and reliable behaviour."

DG Magwood: Let me end with one last question. Tell me about something that you think you did really well as a leader; something that did not go as well; and the one thing that you really want to accomplish over the next few years.

DG Wanner: When I became chair of the Western European Nuclear Regulators' Association (WENRA) in 2012, a member came to see me and said that he would not participate in the meetings because they did not provide enough value. I realised that one of my tasks would be to provide sufficiently challenging and interesting content if I wanted members to participate, given that it is an entirely voluntary organisation with no obligation to attend. Seven years later, I feel that I did my job well, because the chief inspectors are still coming to the meetings. Regarding what has not gone as well as a leader, I realised only belatedly the importance of social skills. Previously, I had believed that technical skills were all

that was needed, and I regret not having started working on this area earlier. In terms of plans for the future, I think that nuclear safety culture is of key importance, and I hope that we can continue with this concept of "continuous improvement".

CNO Harrison: Starting with what am I most proud of, I think that the real opportunity of anyone who is as fortunate enough as I have been to enjoy the positions that I have been in is to leave a legacy. It is not about what you personally do, but about what happens after you are gone. If you look at the performance of a station that you have been involved in, what matters is not necessarily how it performed while you were there, but rather how it did after you left. Did you make yourself dispensable? Personally, I was proud that the nuclear station where I served as director continued to achieve high safety performance even after I had departed. In terms of something that I have learned, in my younger years as a manager, I often overly focused on and rewarded heroic behaviour, and did not do enough to recognise the staff who delivered consistent and reliable high performance. Celebrating drama and crisis management creates a reactive organisation. I wish that I had sought out and better rewarded the "boring", safe, sustainable, and reliable behaviour. In terms of legacy and vision, my role at the moment is overseeing Region 1, which contains the old nuclear power stations. Within the next decade, we will transition to end-of-generation and those assets will be closed. What I want to happen is the best-ever performance from those stations in the next years, and for everyone who then leaves – be that to transfer to another station or to retire – to be proud of achieving and delivering that. I do not want it to be a dramatic cliff-edge, "oh the reactor is closing!" That is what I would want to see happen.

DG Magwood: I appreciate both of you participating in the conversation. It has been very enlightening. Thank you to the two of you. ■


NEA • IAEA • WANO
Workshop on Human Capital:
A Community Approach for the Safe
and Efficient Use of Nuclear
OECD
WILLIAM D. MAGWOOD, IV

William D. Magwood, IV

Director-General, OECD Nuclear Energy Agency (NEA)

Mr Magwood took up his duties as Director-General of the Nuclear Energy Agency (NEA) on 1 September 2014. He has extensive experience in both the regulatory and developmental aspects of nuclear energy, including at the international level. From 2010 to 2014, he served as one of the five Commissioners appointed by the US President and confirmed by the US Senate to the US Nuclear Regulatory Commission (NRC). While a commissioner, he advocated the importance of nuclear regulatory independence and the necessity of maintaining strong, credible and technically sound nuclear regulation in the United States and all countries that use nuclear power.

Previously, Mr Magwood was Director of the US Government's civilian nuclear energy programme at the US Department of Energy (DOE). During his tenure, he established the Idaho National Laboratory; created activities that reversed the decline of US nuclear technology education; and launched important initiatives such as the Generation IV International Forum (GIF) and the US "Nuclear Power 2010," which helped restart nuclear plant construction in the United States. He was also actively involved in the work of the NEA, serving as a Steering Committee Bureau member from 1999 to 2005, including a term as Chair of the Steering Committee from 2004 to 2005. Mr Magwood, a US national, holds Bachelor degrees in Physics and English from Carnegie Mellon University and a Master of Fine Arts from the University of Pittsburgh.

Hans Wanner

Director-General, Swiss Federal Nuclear Safety Inspectorate

Mr Wanner studied chemistry at ETH Zurich and obtained his PhD in 1984. Following a research assignment at the Paul Scherrer Institute where he developed models for chemical processes in a deep geological repository, he joined the NEA in 1986. He worked on the development of the international Thermochemical Database and quality standards for the verification of data by international experts. He co-ordinated this project during 6 years.

On his return to Switzerland, he joined MBT Environmental Engineering Ltd. and managed projects in the field of deep geological disposal.

In 1995, Mr Wanner joined the Swiss nuclear safety authority HSK as a geochemist in the geological disposal section. In 2007, he was appointed Director of the Transport and Waste Management Safety Division, and in 2010 Director-General of ENSI.

In November 2011, Mr Wanner was nominated Chairman of WENRA, the Western European Nuclear Regulators' Association.

Mike Harrison

Chief Nuclear Officer, EDF Energy Region, United Kingdom

Mr Harrison has enjoyed a long, wide-ranging and diverse career within the UK nuclear industry culminating in the appointment as Chief Nuclear Officer for the EDF Energy Region 1 fleet of nuclear power stations in January 2018.

Mr Harrison's professional qualifications include a BSc in Mechanical Engineering from the University of Leeds and an MBA in Business Administration from Henley Management College.

Previous Insights from Leaders in Nuclear Energy
are available on the NEA website:

www.oecd-nea.org

The Nuclear Energy Agency (NEA) is an intergovernmental agency established in 1958. Its primary objective is to assist its member countries in maintaining and further developing, through international co-operation, the scientific, technological and legal bases required for a safe, environmentally sound and economical use of nuclear energy for peaceful purposes. It is a non-partisan, unbiased source of information, data and analyses, drawing on one of the best international networks of technical experts.

The NEA has 33 member countries: Argentina, Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, Norway, Poland, Portugal, Romania, Russia, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The NEA co-operates with a range of multilateral organisations, including the European Commission and the International Atomic Energy Agency.

Insights from Leaders in Nuclear Energy shares personal insights through a series of in-depth conversations between the OECD Nuclear Energy Agency Director-General and leading figures in the sector. Each conversation explores the current issues and offers new ways to address challenges and aim for excellence.

Nuclear Energy Agency (NEA)
46, quai Alphonse Le Gallo
92100 Boulogne-Billancourt, France
Tel.: +33 (0)1 73 21 28 19
nea@oecd-nea.org **www.oecd-nea.org**

OECD/NEA, September 2019