



THE NUCLEAR NEWS INTERVIEW

Zack Pate: His WANO career

Zack Pate in July turned over chairmanship of the World Association of Nuclear Operators to his successor, Japan's Hajimu Maeda, of Kansai Electric Power Company. As WANO's third chairman, Pate was first elected in May 1997.

WANO's third chairman steps down and takes a look back at the worldwide nuclear safety organization.

WANO was formed in response to the 1986 Chernobyl accident. The mission of WANO, a worldwide association of utilities that operate nuclear power plants, is to maximize the safety and reliability of those plants. Utilities in 34 countries that operate 441 nuclear reactors worldwide are members. WANO operates through four regional centers in Atlanta, Moscow, Paris, and Tokyo, with a coordinating center in London.

Pate also is chairman emeritus of the Institute of Nuclear Power Operations, in Atlanta. INPO, sponsored by the nuclear industry, is an independent, non-profit organization whose mission is to promote excellence in the operation of nuclear power plants in the United States. Pate was named chairman emeritus in March 1998, following 18 years of service with INPO, including 14 years as president and CEO, and later as chairman.

He has been elected to the National Academy of Engineering and has been awarded the William S. Lee Award for Industry Leadership, the James N. Landis Medal, and the Henry DeWolf Smyth Nuclear Statesman Award.

Pate graduated from the U.S. Naval Academy in 1958, and in 1970 received a Ph.D. in nuclear engineering from the Massachusetts Institute of Technology. From 1958 to 1980, he served in the United States Navy in assignments that included chief engineer and commanding officer of nuclear-powered submarines. For his last three years of naval service, he was a special assistant to Adm. Hyman Rickover at the Naval Reactors Headquarters in Washington, D.C.

Among his accomplishments at WANO, Pate established nuclear plant performance indicators and five-year goals. The performance-indicator program gave the industry the means to measure improvement and, in the process, an added incentive to improve.

Pate talked with Rick Michal, *NN* senior associate editor, during the ANS Annual Meeting in June in Hollywood, Fla. The conversation centered on WANO's past and current activities in promoting nuclear plant safety, and about Pate's years as WANO chairman.



Pate: "Spirit of cooperation has grown"

What accomplishments are you most proud of during your term as WANO chairman?

There are several. First, when WANO was initially formed, there was a sense of obligation to participate in this new safety organization—the Chernobyl accident had a huge impact in that regard, of course. At the time, though, there was less of a willingness to take ownership of WANO programs. Over the years, we've seen that change, so that today members in all four WANO regions take ownership, and use the programs as a resource for improving plant performance and safety. This transition, which started well before I became chairman, has come a long way during the past few years and I'm extremely pleased by that.

Another point I would mention is that more members are showing a stronger commitment to WANO, as shown, for example, by a threefold increase in participation in WANO training seminars and workshops over the past five years.

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The last point I would make is that the spirit of cooperation in WANO has grown over the years.

So, in summary, the members' ownership, commitment, and their spirit of cooperation have matured over the past several years, and I'm extremely pleased to see that.

“One of WANO's most important challenges is to convey the importance and urgency of sharing information...”

What are WANO's current goals and how have they evolved from the original goals?

I would say that WANO has two key strategic goals. First, in general terms, WANO wants to create an environment where all members exchange operating experience freely. Members must provide WANO with information soon after minor mishaps occur. WANO's job is to analyze this information in a timely manner and get the results back to all members in 34 countries. I think those of us who have been in this technology a long time know there is enormous benefit in the exchange of operating experience. It's a simple concept: If lessons learned are applied at home, the same mistakes won't happen at home.

I am sure, for example, that there were precursors to the Chernobyl accident. But it became evident that the operators at Chernobyl weren't getting the benefit of exchanging information with operators in other parts of their own country, let alone with operators in other parts of the world. This real-time sharing of operating experience is one of the reasons WANO was formed. That's a key WANO goal.

The second strategic goal is to encourage members' participation in voluntary peer reviews, and establish a systematic approach for those reviews. The peer review concept has been proven and accepted worldwide as an invaluable means of providing feedback into the daily operations of running a plant. The peer review team is an independent group of experts that comes in, looks around, and points out those areas of plant operations that need to be improved. Sometimes, those areas needing improvement go unrecognized by plant management, so these peer-review teams provide another pair of eyes.

You have said in the past that WANO members have transcended cultural, language, and geographical barriers to share infor-

mation. Yet you also expressed concern that the industry doesn't do enough in sharing operating experience. Could you explain that in depth?

That's probably the most fundamental challenge that WANO faces. I think that we do have a remarkable degree of cooperation in WANO, spreading over 34 countries. At

any meeting, at any forum, there is an atmosphere of cooperation, good spirit, and commitment to nuclear safety. When we get down to the day-in and day-out running of the business, and a plant has something go wrong that quite often is considered minor by

plant personnel, those personnel are busy fixing the problem and may be slow in reporting it to their regional center. They often don't take into account that there may have been similar events at other plants over the years that, combined with this particular event, could be of valuable input to other members.

I think this fact is just the reality of the day-in and day-out business of running this technology. One of WANO's most important challenges is to convey the importance and urgency of sharing information, and get the people in the plant to step back and say, "I need to talk to my regional center about this. I need to invite them to send someone down to look at what happened, get this into the WANO database, and compare it to what has happened in other places around the world and share the lessons learned."

I think that's what has to happen at all the plants. It's not an attitude of no cooperation; it's the fact that the day-in and day-out of the business is so demanding that the sharing of operating experience doesn't get the right priority.

Could some of it be that some cultures consider it shameful to make a mistake and admit it publicly?

I think that we've seen a lot of that historically. I'm not going to name any particular countries, because we've seen it everywhere. But I think we are, in large measure, past that—not completely, but we've come a long way. People have realized that if they are going to get the benefit of what is happening in other places around the world, they have to share information. I think the larger problem today, rather than embarrassment, is just the plain logistics of sharing experiences.

WANO has initiated a team to deal specifically with operating experiences. Could you talk about that?

Yes. Starting about four years ago, we realized that trying to handle operating experience independently in four regions was not so efficient. It also might not get the benefits of synergy that we could get with a central team. We made the decision to form a central team and locate it in Paris. We asked each region to send a member to that central team. It now has been in place for about two years and it's working a lot better than the previous approach, in which the regions were independently handling operating experiences.

The team has put together some high-quality reports. We've solved the problem of synergy and of getting a more uniform approach with a central team, but we still haven't solved the problem of getting the information to the team in as timely a manner and as comprehensively as we would like.

You were quoted during WANO's biennial meeting in March that a core damage event much less serious than TMI's could be the industry's greatest vulnerability. Do you think the threat of this type of event is not being adequately addressed by the industry?

I think that the industry is doing everything it reasonably can do to keep safety standards high and keep the practices and behaviors up to high standards. That's the underlying approach, across the board, of preventing a core-damaging event. I feel very good about that. What I spoke about in March was a relatively minor event's being misunderstood and misinterpreted. One of my worries and one of the things I tried to address in that speech was to get WANO members to talk about nuclear safety, about the reactor core, about what might happen in even a minor event. We all must be prepared to have dialogue about it, to understand exactly where we are, and then communicate it to each other and to our stakeholders.

How has WANO been able to get worldwide cooperation that seems to transcend normal international politics?

I think that's one of the things that we take great pride in. Since WANO was formed in 1990, 34 countries that operate nuclear plants have been members. Representatives from 29 countries came to Moscow and signed the charter 12 years ago. And recently, in Korea, we added Iran as our 34th member country.

I think there is a growing sense that WANO is a good thing for all the countries that operate nuclear plants. Of course, there's a strong natural conviction to support nuclear safety initiatives. Safety is a powerful word. If we can explain the situation to the right people in every country, they don't want to be left out—and they shouldn't be left out.

In light of today's international tensions, how did Iran accept WANO, and, conversely, how did WANO decide to accept Iran as a member?

Iran is building a Russian-designed nuclear power plant, the Bushehr plant, the construction of which is quite far along. One of the important institutional structures of WANO is the regional center concept. The Moscow center is unique in that all the members of the Moscow center operate Russian-designed plants. For the Moscow center, it is a natural thing for them to want this new member that is building a Russian-design plant to join their center. The Moscow center really did the negotiations with Iran and enabled them to become a member.

From a WANO policy standpoint, our approach is very straightforward. If any entity in the world operates a nuclear power plant to make energy for the public, we welcome them as a member. We want them to be a member because we want to help them operate their plant safely. That is in the interest of all of us; it is in the interest of mankind. Being a non-governmental organization, WANO can take that kind of simple, straightforward

Japan, or when any of us as individuals visit plants in Japan, we easily and quickly see that it's part of their culture to do things to high standards and do them right in the first place. That sets an example for everyone who visits those plants. That doesn't mean that Japan holds the "Holy Grail," but on a day-in, day-out basis, they expect everyone to do things right. It's embedded in their culture. That transfers over to other people who visit Japanese plants. Visitors from other countries want to emulate those high standards.

Another good example comes from visits to plants in India and Pakistan. They take such a scholarly approach to nuclear. The people on their staffs are highly educated. They really want to understand the technology. It's good to have others emulate that scholarly approach and their desire to have highly-educated, highly-trained people operating their plants. Operators in India and Pakistan put a tremendous emphasis on training. That obviously is transferable.

I'll go across to the Moscow center now. The Russian operators and the Russian top executives have a strong belief in and a strong commitment to nuclear power. They don't ask the question, "Are we going to

have nuclear power?" They don't debate whether it's a good energy option or not. They take it as a given that it's going to be an energy option. They are committed to making it a high-standard, quality energy option in their country and to achieving

public acceptance in their country. I think that's a commitment that goes through the staff of every Russian plant. There is a real belief that this energy option is here, it's important, and they're going to manage it well. Yes, they made some mistakes. But my impression is that they've learned from those mistakes. I think it's good for a lot of operators who come from countries where there is an ambivalence about nuclear power to see Russia's cultural commitment to it. It's good to see the real ownership of the technology and the belief in the technology that is so deep-rooted in Russia. That helps make improvements and move forward.

What kind of experts become members of peer-review teams?

Peer review teams are made up primarily of plant operational people. Let me give you an example. A typical team consists of 15 to 18 people from member plants. That team is going to have someone from radiation protection who might be the manager of the radiation protection department. The team is going to have a chemistry manager

or similar chemistry person from a plant. It's going to have a maintenance manager or person who is at a fairly high experience level in maintenance. It's going to have someone who has a lot of engineering experience. There will be someone who specializes in training. It's going to have two or three people who specialize in operations. We go through about eight key positions in the plant and draw from all of those. The team leader is likely to be a plant manager or someone who has been a plant manager in the past.

We cover the full spectrum, from the plant manager to the person who may be two levels down from the chemistry manager in the plant. That varies from team to team. It's a methodology that is designed to do two things. First, to provide a plant with a visiting team that has a great deal of experience in those key areas that are necessary to run the plant. Then the team can do a peer review of how that plant is doing and can give management good feedback. Second, we want to draw people who will review this plant in depth during their visit and then take good ideas home. What is almost as much benefit as the peer review is the good practices individual team members take back home.

Does each WANO center schedule the peer review times at the plants for their areas?

Yes. Each WANO regional center handles that individually. The peer reviews are voluntary. We don't have any leverage to require our members to have peer reviews, but we work with them to get the reviews scheduled out a few years in advance. Each individual center has a schedule.

In setting up a peer-review team, the person in the regional center will call an individual plant and request someone with the expertise that is needed. That person would be needed for a team to be formed six months or a year into the future. It wouldn't be fair to call and say we needed someone, such as a radiation protection expert, in two weeks. It takes a huge, long-range planning effort to get these teams in the field.

How long is a plant visit for a peer review team?

Typically it's two weeks on site and one week's training prior to that, for a total of three weeks. Sometimes the training is done on site. Sometimes it's done in a central area and then the team goes to the site.

At the end of the visit, the team compiles the information collected into a report. For example, let's say there's a peer review at the Balakovo plant in Russia. It's about 800 kilometers from Moscow. The team, which in this case would consist of 15 or 16 peer reviewers, will have about 10 people from the Moscow center. That might be five from Russia, two from Ukraine, maybe two from Lithuania, maybe one from Finland. It also

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position, and the regional concept helps enormously.

Do you foresee any difficulty, once Bushehr is up and operating, having peer reviews done there?

I think that WANO will be selective in where the peers come from. Most of the peers will be from the Moscow center, but that is WANO's "modus operandi" anyway, that most of the peers come from a plant's region. I recently attended a peer review at a plant in Finland, for example. I think there were 16 people on the peer review team, and something like 11 of them came from the Moscow center. So, for the first peer review in Iran, most of the team members will be from the Moscow center.

Do the engineering traditions of various geographic regions of the world each bring a specific strength or emphasis that helps improve excellence worldwide?

Yes, and it's easy to give some good examples. I'll arbitrarily start with Japan. When peer-review teams visit plants in

will have two from the Paris center, from France and Belgium; two from the Atlanta center, from INPO and Entergy; and one or two from the Tokyo center, from Kansai Electric Power.

All these people will fly to Russia and be met by people from the Moscow center. They will then work for a week to understand the Balakovo plant, its history, its culture, and to familiarize themselves with the other members of the team. They probably will do that in Moscow so they aren't in the way of plant operations. They would then fly out to Balakovo and spend two weeks there. In the final three days of the visit, they would put together all they've learned.

At the end of the peer review, there is an exit meeting with top management from the plant and senior management from the Russian utility. The WANO team leader and a WANO executive—typically a regional center board member—represent WANO.

Since September 11, is there an emphasis during peer reviews on plant security?

We took the position years ago that the peer review teams will be alert to any security problems, because all team members have security systems at their own plants. They are totally tuned in to what is needed to maintain high levels of security. So if they see any evidence that security isn't to the standards it should be, then the team members will note that and bring it up for discussion with the plant. They will put it in the report.

Having said that, we don't have a security expert on the team. A reason for that is that security is a highly regulated activity by the government. We concluded that while we want to be tuned in to and have the teams be sure to report anything that looks like a shortfall in security, our primary focus is on nuclear operational safety.

What are WANO's expectations regarding peer reviews for every nuclear plant in the United States?

INPO does a peer review every two years at each of its member plants in the United States. Then every six years, a WANO international team with several people from other countries conducts a peer review at each U.S. plant.

Internationally, what WANO wants to see, and I think most of our members want to see, is a peer review at least every three years by an outside group made up of personnel from the plant's own regional center. Then, at least every six years, a full-scale WANO peer review should be conducted. This approach is already in use in many member countries.

What are WANO corporate peer reviews?

That's a new activity in which we offer to a member the ability to form a team of high-level executives that comes in and

through a series of discussions, meetings, and review of material, gives the members feedback on how well their corporate organization supports and monitors the nuclear side of the business.

That's a complex thing unto itself. The way corporate organizations support, for example, personnel policies, various aspects of human resources, of purchasing, of warehousing, and so on, it's different from company to company. WANO offers a team of executive-level experts of maybe eight or 10 people to come in and examine the corporate organization's high-level support of nuclear activities. We've done two of these reviews to date, and I expect this program to grow in an evolutionary way.

Are WANO's performance indicators used at every nuclear power plant in the world?

Yes. All the plants report data to a central database. Although some plants report more data than others, it's an extremely healthy, mature system. For example, last year 428 units reported data for five or more performance indicators—there are more than 440 units worldwide, but at any one time there are a dozen or so that aren't operating for some reason. So, 428 units gives us a complete set of data.

What have PI results told us about improvements in the industry worldwide?

We recently developed a graph showing the composite index of five key performance indicators. These are unit capability factor, unplanned capability loss factor, unplanned automatic scrams, collective radiation exposure, and industrial safety accident rate. The graph shows very favorable trending of the average performance around the world. It also shows an impressive trend of the lowest quartile of performance around the world. What that means, essentially, is that over the past 12 years the lowest quartile has risen from a performance indicator index of 42 all the way up to 79—it's almost doubled. Of course, that's what WANO is most interested in—what the plants on the lower end of the performance spectrum are doing and how we can help bring them up.

Performance indicator data is available online, on CD-ROM, or we can send hard copies to any member who requests it. A member can use the data to see how a plant is performing and how any indicator compares to others. For example, a member could check his plant's unplanned capability loss factor and compare it to plants in his same region or compare it to plants of similar design. The member could look at the top quartile to see how his plant compares. Human nature being what it is, when people do check the top quartile, they want their plant to be there, too.

So, the performance indicator database has been extremely motivational. It's also

been easy to benchmark. That, without WANO doing anything except sharing the data and encouraging its use, has caused plants around the world to move up the performance scale on their own initiative. This program is probably the most cost-effective of any we could have imagined.

How did you decide to get involved in INPO and then WANO?

I happened to be working at Naval Reactors Headquarters for Admiral Rickover when the Three Mile Island accident occurred in 1979. So, I had firsthand knowledge and access to observe the Kemeny Commission, which was the presidential commission that investigated the TMI accident. I had a growing interest as I watched the proceedings of that commission and began to explore what was happening in the industry. I decided then to retire from the navy and join INPO. I haven't looked back.

As far as the formation of WANO is concerned, we at INPO were shocked by what happened at Chernobyl. I was on vacation with my wife celebrating our anniversary when the accident occurred. My wife reminds me to this day that it wasn't much of a vacation. I think all of us in the nuclear industry quickly came to realize that it was an opportunity for the formation of an international safety organization. So, we aggressively went after that opportunity and tried to figure out how to approach a response to Chernobyl—an obvious example was the U.S. industry's response to TMI. But we realized we couldn't base a worldwide safety organization in the United States and expect people from around the world to warm to that idea. At the same time, the idea of an international safety organization arose in many forums around the world, and so this similar thinking came together and WANO was formed, with its regional offices in four major geographical areas.

What is your future vision for WANO?

I think WANO needs to remain on course through seeking continued improvements. WANO members and all the member countries need to continue viewing WANO as a resource, as an asset that helps improve plant performance. My principal vision is that all members will come to view WANO as a premier nuclear operational safety organization, and use it as a resource.

What would be the WANO legacy of Zack Pate?

I would hope that I have left in place a foundation that the team that succeeds me can build on. This leads to exactly what I said a moment ago, that WANO is moving right down the path to become a premier nuclear safety organization. So if I have left in place a good foundation, I'll be pleased. ■