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U.S. NUCLEAR REGULATORY COMMISSION

REGULATORY INFORMATION CONFERENCE (RIC)
COMMISSIONER PLENARY: GEORGE APOSTOLAKIS

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TRANSCRIPT OF PROCEEDINGS

Public Meeting

APPEARANCES

NRC Staff:

Eric Leeds
Director, Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission

Brian Sheron
Director, Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission

George Apostolakis
Commissioner
U.S. Nuclear Regulatory Commission

1 PROCEEDINGS

2 ERIC LEEDS: If you can give us a moment, I will bring
3 Commissioner Apostolakis and Dr. Sheron up to the podium to take the next
4 stand [spelled phonetically].

5 BRIAN SHERON: Well, good morning. I'm Brian Sheron, director
6 of the Office of Nuclear Reactor -- sorry, Nuclear Regulatory Research.

7 [laughter]

8 Taking -- [laughs] taking Eric's job already.

9 [laughter]

10 The Honorable George Apostolakis was sworn in as commissioner
11 of the United States Nuclear Regulatory Commission on April 23rd, 2010, to a
12 term ending on June 30th, 2014. Dr. Apostolakis has been a distinguished
13 career -- has had a distinguished career as an engineer, professor, and risk
14 analyst. Before joining the NRC, he was a professor of nuclear science and
15 engineering, and a professor of engineering systems at the Massachusetts
16 Institute of Technology. He was also a member and former chairman of the
17 Statutory Advisory Committee on Reactor Safeguards at the NRC. In 2007, Dr.
18 Apostolakis was elected to the National Academy of Engineering for innovations
19 in the theory and practice of probabilistic risk assessment and risk management.
20 He received the Tommy Thompson Award for his contributions to improvements
21 of reactor safety in 1999 and the Arthur Holly Compton award in education in
22 2005 from the American Nuclear Society. Dr. Apostolakis is an internationally
23 recognized expert in risk assessment. Dr. Apostolakis holds a Ph.D. in

1 engineering science and applied mathematics, which was awarded in 1973, and
2 a master of science degree in engineering science, which was awarded in 1970,
3 from the California Institute of Technology. He earned his undergraduate degree
4 in electrical engineering from the National Technical University of Athens, Greece
5 in 1969. Commissioner?

6 [applause]

7 COMMISSIONER APOSTOLAKIS: Thank you, Brian. Hello,
8 everybody. Before I start, I would like to say that I fully agree with Commissioner
9 Svinicki: I'm also grateful that there is no draft here to mess up my hair.

10 [laughter]

11 But she also mentioned something that Admiral Rickover said, and I
12 agree with him. But I must say that, being a former professor, and maybe the
13 chairman agrees with me, I have a certain amount of fondness for academic
14 reactors.

15 [laughter]

16 Now, the title of my speech is, "The Education of an Engineer in
17 Policymaking." And something interesting happened. A member of my staff was
18 having lunch with an attorney from the NRC. And when the attorney heard the
19 title of my speech, he asked smilingly, "Can you really educate an engineer?"

20 [laughter]

21 That was a mistake on his part --

22 [laughter]

23 -- because now I feel free to tell lawyer jokes.

24 [laughter]

25 So an engineering graduate student and a law student --

1 [laughter]

2 -- were having lunch.

3 [laughter]

4 The engineer started peeling an orange. The law student asked,
5 "Now, if you were to give someone an orange, how would you go about doing it?"
6 The engineer replied, "Here's an orange." The law student said, "No, no, no, no.
7 That's not the way you do it. I would say, 'Consistent with all relevant statutes, I
8 hereby give and convey to you all in singular [unintelligible] state and interests,
9 rights, claim, title, and advantages often [spelled phonetically] in said orange
10 together with all the rind, juice, pulp, and seeds, and all rights to bite, cut, freeze,
11 and otherwise eat the same or give the same away, with or without the pulp,
12 juice, rind, and seeds.'"

13 [laughter]

14 Having dispensed with that lawyer joke --

15 [laughter]

16 I can now begin [laughs] with my education as a commissioner.

17 [laughter]

18 I have now been a commissioner for almost three years. Before
19 that, I spent my whole career in academia, first at UCLA and then at MIT. My
20 appointment as a commissioner resulted in a major change in that blissful life.

21 [laughter]

22 Today I will offer several observations from this change. Before I
23 start, though, I know that some of you view me as a commissioner who is always
24 promoting the use of risk information in regulatory affairs. I'm going to promise
25 something that may shock some of you. My objective here today is to get

1 through the entire speech without mentioning PRA any further.

2 [laughter]

3 I hope you appreciate how painful that is for me.

4 [laughter]

5 I have found Commission activities to be a fascinating combination
6 of science, engineering, law, policy, and stakeholder interaction. The
7 Commission as a collegial body formulates policies, develops regulations, issues
8 orders to licensees, and adjudicates legal matters. First let me talk about
9 science and engineering, because this is what I'm most comfortable with. Our
10 technical staff deals with multidisciplinary problems that require expertise that
11 goes beyond the solving of equations. It also requires an understanding of the
12 regulatory framework and the regulatory objectives. Before becoming a
13 Commissioner, I -- as Brian mentioned, I have spent 15 years serving on the
14 Advisory Committee on Reactor Safeguards. During my time on the ACRS, I
15 was continuously impressed by the technical expertise of the NRC staff. That
16 impression continues today. The NRC staff is made up of a diverse group of very
17 intelligent individuals dedicated to serving the important mission of this agency. I
18 am very thankful for the support of the NRC staff in carrying out the
19 Commission's work. I am less thankful when they don't agree with me.

20 [laughter]

21 Now I would like to talk a little bit about law. The NRC is a federal
22 agency operating under several mission-setting statutes, like the Atomic Energy
23 Act, and many other laws like the Government in the Sunshine Act and the
24 Administrative Procedure Act. One challenge was a practical realization that I
25 could not have a private conversation with more than one of my Commission

1 colleagues on most substantive matters. Even when we're having lunch, it is
2 advisable to have an -- our lawyers present. Incidentally, another thing that took
3 getting used to is how much of my life is controlled by my staff, particularly my
4 administrative assistant, Kathleen, who determines what I do every hour of the
5 day.

6 [laughter]

7 A new area for me was dealing with adjudicatory matters. Many
8 restrictions come with a commissioner's position as, in effect, an appellant judge
9 in hearing-related matters. In that role, commissioners are required to rule on
10 many issues that are being pursued in our hearing processes before an Atomic
11 Safety and Licensing Board. Because of this role, there are restrictions on
12 speaking to the technical staff and others about such matters until a final decision
13 is reached. Being a former professor I find this frustrating, especially when it is a
14 topic in which I have a strong interest. Many believe that our government
15 agencies are too bureaucratic and decisions take too long to make. But by
16 design, our processes are open and transparent, and involve our public
17 stakeholders. It takes time to ensure that we have done a complete analysis and
18 have considered all of the significant impacts of proposed actions. While I agree
19 that this is the way it should be, I have to learn to be patient with this process.
20 And some of my staff think I'm still learning to be patient.

21 [laughter]

22 With regard to the Commission's duty of formulating policy, I
23 learned a lot about the diversity and large number of policy issues that have
24 come before the Commission. This is in part -- in large part due to our review of
25 our requirements in light of the accident at the Fukushima plants in Japan. The

1 Commission has faced serious policy issues related to decisions about how to
2 best address beyond-design-basis accidents in our regulatory system, including
3 decisions about when it is appropriate to impose new requirements in the name
4 of adequate protection of public health and safety. The decisions have not
5 always been easy, in part because the Atomic Energy Act does not define
6 "adequate protection"; neither does the Commission in its regulations. Although
7 the Commission must decide the minimum level of safety that is necessary to
8 allow licensed activities, the Commission has wide discretion in deciding how to
9 achieve that statutory objective. And as one court has stated, quote, "The
10 determination of what constitutes adequate protection under the act, absent
11 specific direction from Congress, is a situation where the Commission should be
12 permitted to have discretion, to make case by case judgments based on the
13 technical expertise and on all relevant information," unquote.

14 The Atomic Energy Act also grants authority to the Commission to
15 provide a measure of safety above and beyond what is required or what is
16 adequate. The Commission may require power plants already satisfying the
17 standard of adequate protection to take additional safety precautions that the
18 Commission deems necessary to protect health and minimize danger to life and
19 property. Although the exercise of this authority is discretionary, the Commission
20 has established general criteria and a process in its backfit rule for imposing new
21 requirements on existing power plant licensees. Deciding what is adequate
22 protection and what is a justified safety enhancement is not always easy. In
23 short, the Commission is rarely faced with a black and white situation when
24 addressing safety issues. Safety is an amorphous concept. Incidentally, my staff
25 told me not to use "amorphous."

1 [laughter]

2 But it's of Greek origin, so --

3 [laughter]

4 To give you an idea of some of the variety of topics the Commission
5 considered in the past year, we held public meetings on such diverse topics as --
6 here's a long list, now -- license renewal for research and test reactors, matters
7 of interest to the organization of agreement states and the Conference [spelled
8 phonetically] Of Radiation Control Program Directors, the final report of the Blue
9 Ribbon Commission on America's Nuclear Future, the revision of reporting
10 criteria for medical events, the status of medical isotope production in the United
11 States, the result of the agency's annual performance assessment of its
12 licensees, a joint meeting with the Federal Energy Regulatory Commission on
13 grid reliability, the status of lessons learned from the Fukushima Daiichi accident,
14 the economic consequences of nuclear accidents, the operator licensing
15 program, the status of recovery actions at the Fort Calhoun station, venting
16 systems for BWR Mark I and Mark II containments, steam generator, tube
17 degradation, and uranium recovery. These meetings provided an open forum for
18 the Commission, the NRC staff, and our external stakeholders to discuss issues
19 important to safety to the agency.

20 Now I'll talk a little about stakeholder interaction. On day one, I
21 learned that another duty of a Commissioner is to approve outgoing Commission
22 correspondence. These are affectionately known as "CORS" [spelled
23 phonetically] among the commissioners and their staffs. The large volume of
24 letters from Congress, local governments, and the public was just one of the
25 many things I did not expect to be spending a lot of time on as a commissioner.

1 There is clearly a high and justified level of interest in the agency's work. That
2 interest has increased tenfold after the accident at Fukushima. I have had the
3 honor of appearing before both the House and the Senate on several occasions
4 in the past three years. And I must tell you, this can be a humbling experience. I
5 imagine this is the way that the staff feels before -- when they appear before the
6 ACRS.

7 [laughter]

8 I would have to say that the most difficult experience for me as a
9 commissioner came when I was publicly accused of not caring about safety. This
10 was definitely the low point in my service on the Commission. Almost as difficult
11 to take, at times, is the negative portrayal of the NRC by some individuals, such
12 as when the commissioners are portrayed as being lap dogs of the industry. This
13 portrayal could not be further from the truth. On the other hand, it was very
14 gratifying when I hear people refer to the NRC as the gold standard of regulatory
15 agencies. And I'll give you two examples. In an opinion piece published by
16 Bloomberg late last year, a former head of the nationwide litigation program
17 within the Enforcement Division of the Securities and Exchange Commission
18 observed that it was time for regulators at the SEC to do much more to prevent
19 problems before they occur. He suggested that the SEC follow the example of
20 the NRC as a, quote, "federal regulator that places the highest priority on
21 prevention," unquote, and that, quote, "has achieved impressive results through a
22 regulatory regime that includes continuous inspection of all 104 operating U.S.
23 nuclear plants," end of quote.

24 Another example of the NRC being regarded as a gold standard
25 came in the aftermath of the Deepwater Horizon oil spill. The Department of

1 Interior's Minerals Management Service was a regulator for offshore oil drilling
2 before the BP Deepwater Horizon blowout in 2010. The National Commission on
3 the BP Deepwater Horizon Oil Spill, created by President Obama in the wake of
4 the disaster, found that the Minerals Management Service had a cozy
5 relationship with the oil industry that led to safety lapses. In response to the
6 disaster, the Minerals Management Service was broken up into multiple offices,
7 one of which is the Bureau of Safety and Environmental Enforcement, created to
8 carry on the oversight function. The National Commission also found that the
9 industry needed an overhaul in culture, and recommended looking at the nuclear
10 industry for an example in drastic improvement in safety culture. The National
11 Commission noted that following the accident at Three Mile Island, the NRC
12 began initiatives to help influence the safety culture of the nuclear energies
13 industry toward continuous improvement.

14 One of these initiatives was to work with a nuclear industry and the
15 public to develop a formal policy on the NRC's expectations for a strong and
16 effective safety culture. Last December, in an attempt to instill a positive safety
17 culture among both offshore oil regulators and the industry, the Bureau published
18 a Safety Culture Policy Statement. In that policy statement, the Bureau stated
19 that it, quote, "has reviewed the NRC's safety culture policy and believes it
20 provides a strong foundation for a similar approach for oil and gas operations,"
21 end of quote. A commissioner must listen to many voices and viewpoints when
22 considering policy issues. In addition to receiving the views of the NRC staff, a
23 commissioner often receives diverse viewpoints from many other sources,
24 including Congress; nongovernmental organizations; other federal agencies;
25 state, local, and tribal governments; and individual members of the public. These

1 viewpoints can be expressed in letters or emails to the Commission, or at
2 Commission meetings or other venues.

3 At times, some people can be very passionate about their views on
4 certain issues. And those views can become infused with emotion.
5 Nevertheless, it is important to listen to and try to understand each individual's
6 point of view in order to get a balanced perspective of the issues. Diverse points
7 of view also arise among our own staff. And we have a number of initiatives to
8 ensure that such viewpoints are heard. The agency's open collaborative work
9 environment encourages all employees to promptly raise concerns and differing
10 views without fear of reprisal. The NRC's open door policy allows any employee
11 to initiate a meeting with an NRC manager or supervisor, including a
12 commissioner or the chairman herself. Under the NRC's nonoccurrence process,
13 employees may choose not to concur on any part of a document in which he or
14 she has disagreed. In addition, employees are permitted to document their
15 concerns and attach them to proposed staff positions to be forward with a
16 proposed position as it moves through the management approval chain.

17 Finally, the Differing Professional Opinions Program is a formal
18 process that allows all employees and contractors to have their different views on
19 established mission-related issues considered by the highest level managers in
20 their organizations. After a decision is issued to an employee, he or she may
21 appeal the decision to the executive director of operations or the chairman, as
22 appropriate. Regardless of their opinion on specific issues, I have observed that
23 all NRC staff share a strong focus on the agency's important mission of
24 protecting public health and safety. I'm sorry -- and promoting the common
25 defense and security, and so on and so on.

1 [laughter]

2 Speaking of diverse viewpoints, the Commission itself has diverse
3 points of view. And I consider this to be a positive, healthy thing. Nuclear safety
4 matters are technically complex. This is one of the reasons that there is an
5 independent, five-member Commission. The Commission's independent and
6 multi-member character, with staggered terms for its members, is designed to
7 insulate regulatory decisions from political consideration and to provide stability
8 for regulatory policy. This Commission structure allows for a diversity of insights
9 to be brought to bear in the Commission's decision making.

10 With regard to decision making, I have been very impressed by
11 how decisions are made at the NRC. Decisions on nuclear safety matters should
12 not be made without careful deliberation. Such deliberation includes the
13 technical evaluations by NRC senior management, the views of the Statutory
14 Advisory Committee on Reactor Safeguards, public meetings, and inputs from
15 external stakeholders. The benefits of this open and transparent process were
16 highlighted in the Agency's implementation of lessons learned from the
17 Fukushima accident. As a result of this process, the technical basis for
18 implementing the NRC's near-term task force recommendations was
19 strengthened and additional technical issues for consideration were identified. In
20 particular, review of the recommendations by senior NRC staff members
21 identified additional issues such as filtration of containment vents and loss of the
22 ultimate heat sink. The ACRS made recommendations related to seismic and
23 flood evaluations. Finally, public stakeholders made contributions on issues such
24 as the distribution of potassium iodide following an accident, and offered
25 perspectives on the process for issuing orders.

1 As I have already stated, the Commission is well served by its
2 dedicated staff, with many senior members who bring long experience and
3 advanced technical expertise. The NRC has long been known for the stellar
4 reputation of its staff. I have learned a great deal about an employee's --
5 employee recruitment and retention programs since becoming a commissioner.
6 In particular, I have been very impressed by our programs for promoting a
7 diverse workforce at the agency. I have had the pleasure of attending many
8 events celebrating diversity at the NRC. I have a much greater appreciation for
9 NRC's strides towards greater diversity.

10 One of the benefits of my role as a commissioner is the opportunity
11 to visit the facilities of many of our reactor and materials licensees. I view these
12 visits as essential to my understanding of how our requirements are implemented
13 in the field. I have also had the pleasure of visiting all of the NRC's regional
14 offices near Philadelphia, Atlanta, Chicago, and Dallas. I am always impressed
15 by our NRC staff members who are serving in the frontlines of the agency's
16 business. I am especially impressed by the quality and dedication of our
17 inspectors. Finally, I have had the opportunity to meet with the NRC's regulatory
18 counterparts and others in the nuclear field in other countries. I find the sharing
19 of experiences with our fellow regulators to be an invaluable experience.

20 In conclusion, I hope that I have given you some idea of the many
21 ways in which this lifelong engineer and academic has been educated as a
22 commissioner. I have to say that if this job were only about the science it would
23 be much easier. People often say that life is a process of continuous learning.
24 And in this job I'm learning something new every day. The question I get asked
25 more often -- most often is, "How do you like being a commissioner?" I can tell

1 you that I'm enjoying my time on the Commission very much. I'm particularly
2 gratified that most people can now pronounce my name reasonably well.

3 [laughter]

4 It is a very challenging and rewarding experience, and I'm grateful
5 that I get to work every day with high caliber people such as my fellow
6 commissioners and the NRC staff. I consider it an honor to serve on this
7 Commission. Normally, this would be the end of my speech. But I cannot resist
8 this: What do you get when you cross the Godfather with a lawyer?

9 [laughter]

10 You get an offer you cannot understand.

11 [laughter]

12 [applause]

13 BRIAN SHERON: Okay, thank you very much. We've got a
14 number of questions here. The first one is, "How do you believe the agency is
15 doing at achieving the principle of 'good regulator' in today's environment?"

16 COMMISSIONER APOSTOLAKIS: I think it's doing very well.

17 [laughter]

18 BRIAN SHERON: And so it starts.

19 [laughter]

20 Next question: Our EDO, Mr. Borchardt, stated that the \$52 million
21 sequestration will come from cutting long-term research. Since \$52 is more than
22 half of NRC's research budget, isn't the strategy unrealistic? Or is the NRC out
23 of performing research?

24 COMMISSIONER APOSTOLAKIS: No, no. It's really sad that we
25 have to do this. I've always appreciated research and long-term research. I think

1 that's what keeps this agency being what it is, a great regulator. But I think it's
2 the timing issue, too. And something has to give. So I'm certainly not too thrilled
3 by what's happening. Yeah.

4 BRIAN SHERON: Yeah. I would just add, since I'm the director of
5 the office, the budget was actually cut \$12 million. And our budget is about \$50
6 million. So it's about a 25 percent cut in the research budget. Next question is --
7 let's see -- "It is interesting that you are talking about the education of an
8 engineer, and NRC has decided to eliminate its entire 2013 education grant
9 budget. The NRC decision will have a devastating effect on the nuclear
10 education programs."

11 COMMISSIONER APOSTOLAKIS: I agree.

12 [laughter]

13 BRIAN SHERON: What is NRC management doing to influence a
14 risk-informed, performance-based philosophy throughout NRC staff and its
15 licensees?

16 COMMISSIONER APOSTOLAKIS: Well, the agency has been
17 promoting the use of risk information for the last 15 years or so, more than that,
18 in writing, in the regulatory guides and so on. As most of you know,
19 recommendation one of the near-term task force after Fukushima recommended
20 that the agency come up with a way to combine risk information with traditional
21 defense in depth. And there are some other recommendations. And the staff is
22 working very hard on this recommendation. And last April, a task force, those
23 under my supervision, issued another report proposing risk management
24 regulatory framework. So what the staff is doing now is combining ideas from
25 that report and also their experience and what the near-term task force said, to

1 come up with the recommendations to the Commission, which -- I expect that
2 later.

3 BRIAN SHERON: The new safety regulation development is
4 underway in post-Fukushima Japan, but we haven't yet seen a risk-informed
5 approach or a consideration of it. With the lack of experience and knowledge of
6 PRA, how can the regulator and operators in Japan develop and appreciate the
7 risk-informed approach NRC has implemented over the years?

8 COMMISSIONER APOSTOLAKIS: Well, it's not my place to really
9 comment on what our Japanese colleagues are doing. So maybe I shouldn't
10 comment on this. But I am going there in April and I'm going to talk about risk-
11 informed regulations.

12 [laughter]

13 BRIAN SHERON: Okay. The next one is: On the scale of 1 to 10,
14 1 being minimal and 10 being absolutely critical, how valuable is the NEPA
15 process in addition to a sound, risk-based decision?

16 COMMISSIONER APOSTOLAKIS: The NEPA process?

17 BRIAN SHERON: NEPA process.

18 COMMISSIONER APOSTOLAKIS: Yeah.

19 BRIAN SHERON: Yeah.

20 COMMISSIONER APOSTOLAKIS: I don't know.

21 [laughter]

22 BRIAN SHERON: What is the path forward on NUREG 2150?

23 COMMISSIONER APOSTOLAKIS: On what?

24 BRIAN SHERON: NUREG2150.

25 COMMISSIONER APOSTOLAKIS: Remind me what that is.

1 BRIAN SHERON: Risk -- that's your Risk Management Task Force.

2 COMMISSIONER APOSTOLAKIS: Oh.

3 [laughter]

4 As I said, the recommendations we make in the report regarding
5 power reactors are being evaluated now by the staff, in conjunction with
6 recommendation one of the near-term task force. The other recommendations
7 that refer to the other offices' known reactor -- known power reactor applications
8 will be evaluated by the staff. And a report will come to the Commission six
9 months after some deadline that I don't remember.

10 BRIAN SHERON: What changes to the Commission and NRC
11 have you noted since Chairman Macfarlane has come onboard?

12 [laughter]

13 COMMISSIONER APOSTOLAKIS: We are now very friendly to
14 each other and --

15 [laughter]

16 -- very collegial.

17 BRIAN SHERON: Let's see. Has Fukushima impacted closure of
18 lingering safety issues, such as sump issues?

19 COMMISSIONER APOSTOLAKIS: Sump?

20 BRIAN SHERON: Such as sump issues.

21 COMMISSIONER APOSTOLAKIS: I don't know of a direct impact.
22 But certainly Fukushima has had an impact on at least how some of our -- at
23 least the way I'm thinking about safety issues.

24 BRIAN SHERON: Do you have any comments on LENR, Low
25 Energy Nuclear Radiation? Is this fact or fiction?

1 COMMISSIONER APOSTOLAKIS: No.

2 [laughter]

3 BRIAN SHERON: This one says, "Would you please vote to restart
4 the Yucca licensing proceeding? Your recusal on voting on the substance of the
5 Yucca case does not mean you cannot vote on the procedural issue before the
6 Commission.

7 COMMISSIONER APOSTOLAKIS: My legal assistant will tell me
8 what I can and cannot do.

9 [laughter]

10 I don't know.

11 BRIAN SHERON: Okay.

12 [laughter]

13 What do you see as the biggest obstacle to reprocessing in this
14 country?

15 COMMISSIONER APOSTOLAKIS: I'm not an expert. It seems to
16 me it's economics.

17 BRIAN SHERON: Let's see. What will be the effects on NRC if
18 sequestration continues to the next year and beyond?

19 COMMISSIONER APOSTOLAKIS: I hadn't thought about it. But it
20 won't be a good thing, I don't think.

21 [laughter]

22 BRIAN SHERON: Okay. And the last one I have right here is:
23 Safety culture can significantly affect safety; how can safety culture be
24 considered in PRAs?

25 COMMISSIONER APOSTOLAKIS: It cannot.

1 [laughter]

2 BRIAN SHERON: Okay. Thank you.

3 [applause]

4 BRIAN SHERON: Good job. Okay. I think we finished up a little bit
5 early.

6 [laughter]

7 So I think now it's time for the lunch break. And I believe we'll
8 reconvene back here at 1:30.

9 [Whereupon, the proceedings were concluded]