

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
OFFICE OF THE SECRETARY

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:
E. Roy Hawkens, Chair
Dr. Paul B. Abramson
Dr. Anthony J. Baratta

In the Matter of)	
)	Docket No. 50-219
AMERGEN ENERGY COMPANY, LLC)	
OYSTER CREEK NUCLEAR)	
GENERATING STATION)	
)	September 14, 2007
License Renewal for Oyster Creek Nuclear)	
Generating Station)	

**CITIZENS' REPLY TO AMERGEN AND NRC STAFF REBUTTAL
TESTIMONY**

PRELIMINARY STATEMENT

In accordance with an Order from the Atomic Safety and Licensing Board (the "Board"), dated April 17, 2007, this response Brief to the Initial Statements of Position filed by American Energy Company LLC ("AmerGen") and NRC Staff is submitted on behalf of Nuclear Information and Resource Service, Jersey Shore Nuclear Watch, Inc., Grandmothers, Mothers and More for Energy Safety, New Jersey Public Interest Research Group, New Jersey Sierra Club, and New Jersey Environmental Federation (collectively "Citizens").

AmerGen has now affirmatively sworn that it is unable to quantitatively estimate the margins above the local area acceptance criteria. This is very surprising because, as

the Atomic Safety and Licesing Board (the "Board") has already found, to estimate the required monitoring frequency, it is essential to estimate the smallest margin and the certainty that the margin is really as large as estimated. Without any quantitative estimate of the margin above the local area acceptance criterion, there can be no justification for basing the monitoring frequency on the margin above the acceptance criteria for mean thickness. Thus, AmerGen has sworn that it will unable to meet its burden in this proceeding.

In addition, Dr. Hausler has shown that the drywell does not meet the least stringent local area acceptance criterion and there is less than 95% certainty that the drywell complies with the other criteria. In this round of testimony he further shows that AmerGen's own assessment is merely a crude approximation of the contouring approach that he has employed. Furthermore, responding to Amergen's testimony on how it analyzed the external data and criticisms of his methods, Dr. Hausler shows that both analyses confirm that even the least stringent version of the local area acceptance criterion is violated. Because the drywell is now beyond the state that was evaluated as acceptable by NRC in 1992 and in 2006, it no longer meets the Current Licensing Basis ("CLB").

Finally, the NRC Staff have admitted that the drywell shell fails an ASME code requirement, if Dr. Hausler's initial assessment of the corrosion using the external measurements is correct. Because this requirement forms part of the CLB, a critical question is whether Dr. Hausler's initial analysis is valid. Responding to this question in this round of testimony, Dr. Hausler shows that his initial assessment was in fact quite

conservative and the areas of severe corrosion are probably considerably larger than previously predicted. Thus, there is now little doubt that the drywell fails the CLB.

A nuclear power plant cannot be relicensed unless there is reasonable assurance that it meets the CLB. Based on the record before the Board, AmerGen's application to relicense the Oyster Creek Nuclear Generating Station ("Oyster Creek") should be denied because AmerGen has affirmatively stated that it cannot meet its burden in this proceeding and, even though they are not required to carry the burden of proof, Citizens have proven that the drywell shell fails to meet the acceptance criteria and an applicable ASME code requirement and is therefore beyond the CLB.

ARGUMENT

I. Additional Response To Board Question 11(a) Regarding The Term Reasonable Assurance

On September 12, 2007, the Memorandum and Order from the Licensing Board made it plain that it still had questions about the issue of confidence and reasonable assurance. Citizens stated in their previous filing that in the context of initial licensing, the United States Court of Appeals for the District of Columbia found no error when a licensing board equated "reasonable assurance" with a "clear preponderance of the evidence" and rejected claims that reasonable assurance means "beyond a reasonable doubt." *North Anna Environmental Coalition v. NRC*, 533 F.2d 655, 667-68 (D.C. Cir. 1976). In the more specific context of corrosion at Oyster Creek, both the reactor operator and NRC staff have regarded 95% confidence as a good yardstick for reasonable assurance. Using case law about the reliability of scientific testimony, this brief shows 95% confidence is normally the minimum accepted by the scientific community and the federal courts.

First of all, a “confidence interval tells us if the results of a given study are statistically significant at a particular confidence level.” *Merrell Dow Pharmaceuticals, Inc., v. Havner*, 953 S.W.2d 706, 723 (Tex. Sup. Ct 1997). Furthermore, Havner decided that 95% confidence is normally the minimum required to establish facts as scientifically proven:

The generally accepted significance level or confidence level in epidemiological studies is 95%, meaning that if the study were repeated numerous times, the confidence interval would indicate the range of relative risk values that would result 95% of the time. *See DeLuca v. Merrell Dow Pharms., Inc.*, 791 F.Supp. 1042, 1046 (D.N.J.1992), *aff'd*, 6 F.3d 778 (3d Cir.1993); Linda A. Bailey et al., *Reference Guide on Epidemiology*, in FEDERAL JUDICIAL CENTER, REFERENCE MANUAL ON SCIENTIFIC EVIDENCE at 153 (1994); Michael Dore, *A Proposed Standard For Evaluating the Use of Epidemiological Evidence in Toxic Tort and other Personal Injury Cases*, 28 HOW. L.J. 677, 693 (1985); Melissa Moore Thompson, *Causal Inference in Epidemiology: Implications for Toxic Tort Litigation*, 71 N.C. L.REV. 247, 256 (1992). Virtually all the published, peer-reviewed studies on Bendectin have a confidence level of at least 95%. Although one of the Havners' witnesses, Dr. Swan, advocated the use of a 90% confidence level (10 in 100 chance of error), she and other of the Havners' witnesses conceded that 95% is the generally accepted level.

Id. at 723-24.

Havner further stated that the federal courts should use 95% confidence as the minimum acceptable for scientific testimony:

We think it unwise to depart from the methodology that is at present generally accepted among epidemiologists. *See generally* Bert Black, *The Supreme Court's View of Science: Has Daubert Exorcised the Certainty Demon?*, 15 CARDOZO L.REV. 2129, 2135 (1994) (stating that “[a]lmost all thoughtful scientists would agree ... that [a significance level of five percent] is a reasonable general standard” (quoting Amicus Curiae Brief of Professor Alvan R. Feinstein in Support of Respondent at 16, *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 113 S. Ct. 2786, 125 L.Ed.2d 469 (1993) (No. 92-102))). Accordingly, we should not widen the boundaries at which courts will acknowledge a statistically significant association beyond the 95% level to 90% or lower values.

Id. at 724.

Even more relevantly, the use of 95% confidence intervals was advocated by federal government scientists in *US v. Chase*, where the court found credible “the testimony of the government's experts that the use of 95% confidence interval is a standard approach that is generally accepted in the scientific community.” *US v. Chase*, 2005 WL 757259, 6 (D.C. Super); *See generally*, DATABASE LIMITATIONS ON THE EVIDENTIARY VALUE OF FORENSIC MITOCHONDRIAL DNA EVIDENCE, 43 Am. Crim. L. Rev. 53, 88+ (2006).

Thus, plaintiffs seeking redress through monetary damages suits must establish their scientific theories with greater than 95% confidence for those theories to be admissible in evidence, because that is the standard generally required by the scientific community. As a corollary, the cases show that a scientific conclusion that is less than 95% certain is generally not fit to address to a jury. Because a scientific assessment with less than 95% certainty would not be good enough to allow a single injured plaintiff that has already been injured to seek redress in federal court, it also cannot be good enough to avert nuclear accidents that could cause harm to thousands of people. It is therefore essential that the NRC make nuclear plant operators prove their scientific theories to at least the 95% confidence required in federal court.

More specifically, to meet the “not inimical” standard in the AEA, the NRC must only permit licensee to use reliable scientific evidence. Federal courts have already decided that scientific proof to less than 95% confidence is unreliable. Therefore, to establish reasonable assurance of compliance with the ASME code a licensee must be able to show with 95% confidence that it has margins over minimum requirements.

II. AmerGen Has Testified It Cannot Meet Its Burden Regarding Margins

The Board has already stated that it expected AmerGen to show to a known confidence level that the drywell shell will not violate the minimum thickness requirements in the interval between UT inspections taking into account the variance of the data. Board Order dated July 11, 2007 at 4.

AmerGen has now testified that it cannot calculate the numerical margin above two of its alleged thickness requirements for the thinnest 12 inch by 12 inch area on the shell and the thinnest 3 feet by 3 feet area on the shell. In addition, it has testified it cannot calculate the margin above the alleged requirement that the largest contiguous area that is thinner than 0.736 inches is less than 3 feet by 3 feet. If AmerGen cannot even calculate these margins, it also cannot possibly estimate the uncertainty in the derived margin. Thus, AmerGen has actually testified under oath that it cannot meet its burden in this proceeding and now finds itself woefully short of meeting the expectations of the Board.

III. Citizens Have Proved That The Drywell Violates The CLB

Even though Citizens do not bear the burden of proof, they have gone beyond what is required of them and proved that the Oyster Creek drywell violates the CLB. Dr. Hausler has previously shown that the drywell does not meet the least stringent local area acceptance criterion and there is less than 95% certainty that the drywell complies with the other criteria. In this round of testimony he further shows that AmerGen's own assessment is merely a crude approximation of the contouring approach that he has employed. Furthermore, responding to AmerGen's testimony on how it analyzed the external data and AmerGen's criticisms of his methods, Dr. Hausler shows that both

analyses confirm that even the least stringent version of the local area acceptance criterion is violated. In 1992, the drywell shell was evaluated as acceptable by NRC, provided the areas thinner than 0.736 inches were “highly localized.” At that time, this requirement was incorporated into the CLB. In spring 2007, the SER evaluated the shell as acceptable, provided the areas within each Bay that are thinner than 0.736 inches are within, at most, a 3 feet by 3 feet cut-out shape. It is unclear if this requirement became part of the CLB. In any event, because the areas of the shell thinner than 0.736 inches go beyond a 3 feet by 3 feet square on the drywell, they are no longer highly localized and therefore the drywell shell no longer meets the CLB.

Finally, the NRC Staff have admitted that the drywell shell fails an ASME code requirement for a safety factor of 2.0 during refueling, if Dr. Hausler’s initial assessment of the corrosion using the external measurements is correct. Because this requirement forms part of the CLB, a critical question is whether Dr. Hausler’s initial analysis is valid. Responding to this question in this round of testimony, Dr. Hausler shows that his initial assessment was in fact quite conservative and the areas of severe corrosion are probably considerably larger than previously predicted. Thus, there is now little doubt that the drywell not only fails the CLB because the areas of severe corrosion are not highly localized, it also fails the CLB because the factor of safety during refueling is less than the required minimum of 2.0.

IV. Minimum Monitoring Frequency Is More Than Once Per Year

Finally, even if the Board accepts AmerGen’s arguments that the margin above the acceptance criterion for mean thickness is the most limiting margin,¹ that margin is

¹ AmerGen has only made this argument implicitly by repeatedly citing 0.064 inches as the limiting margin and failing to mention the other acceptance requirements. Presumably the reason that AmerGen has never

currently 0.064 inches at the mid-range estimate,² and the grand standard error should be used, this translates into a margin of approximately 0.044 inches at the lower 95% confidence limit, including an allowance of 0.01 inches for possible systematic error.³

See AmerGen Ex. 25 at 2 (minimum mean thickness is 0.800 inches, minimum required is 0.736 inches, and grand standard error of mean for grid 19A is 0.05 inches). Future corrosion rates after refueling outages are up to 0.01 inches per year from the interior and 0.039 inches per year from the exterior. The total corrosion rate could therefore be approximately 0.05 inches per year. This means that, at minimum, a UT monitoring frequency of greater than once per year is required.

stated the margins above the local area acceptance criteria is because it has testified that it cannot calculate those margins. There is therefore no evidence to support the argument that the margin above mean thickness requirements is the most limiting.

² To accept this value, the Board would have to ignore the lower estimates of the mean thickness produced from analyses of the external data.

³ Citizens Ex. 37 at 11-12, justifies this allowance.

CONCLUSION

For the foregoing reasons, AmerGen's application to relicense the Oyster Creek Nuclear Generating Station should be denied. In the alternative, should the Board decide to allow the relicensing to proceed, it must ensure that AmerGen meets the burden the Board has set forth and then calculate the monitoring interval based on the minimum established margins.

Respectfully submitted



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Dated: September 14, 2007