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 License Renewal Application for Callaway Plant, Unit 1; Draft Supplemental Generic Environmental Impact Statement

Document: NRC-2012-0001-DRAFT-0012
 Comment on FR Doc # 2014-03845

Submitter Information

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General Comment

Please See Attached File:CallawayLicCommentNRCDocketID-2012-0001markkelly.pdf

Attachments

CallawayLicCommentNRCDocketID-2012-0001markkelly

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C. Fells (exf5)

Comment in Opposition to Allowance of Callaway License Renewal (Docket ID NRC-2012-0001)

The Callaway operating license should not be renewed. The NRC and nuclear industry history of generation and tolerance of inaccurate technical information and records have undermined their abilities to accurately assess the long-term safety and economic consequences of extending Callaway's operating license.

A few examples of the NRC's information problems are described using excerpts from NRC, industry, and court records in the "Supporting Information" section and references cited below.

The NRC's own projections described in the "Callaway Safety Evaluation Report" are that, by 2020, the spent fuel pool at Callaway will be insufficient to off load a core if current practices continue is of particular concern. (Ref. 1) This situation alone should be sufficient reason to deny license renewal. Promises of ISFS in dry casks do not amount to safe storage. (Although some justifications for the license renewal are made by economic arguments, the actual costs of ISFS are uncertain.)

The history of nuclear power is filled with empty promises and faulty projections. "Safe permanent storage or disposal of spent nuclear waste" remains as mythical as "energy too cheap to meter" promised over fifty years ago.

Unites States General Accounting Office (GAO) report described the nature of spent nuclear waste in their report "" cover letter addressed to Senate Committee on Environment and Public Works: **"Spent nuclear fuel-the used fuel periodically removed from reactors in nuclear power plants- is one of the most hazardous materials made by man.** Without protective shielding, the fuel's intense radiation can kill a person within minutes if directly exposed to it or cause cancer in those exposed to smaller doses." (Ref. 2).

One serious accident could render large parts of the US uninhabitable.

NRC and industry records indicate that their information problems are systemic. All projections and decisions are made based on information. Therefore, NRC and industry information, projections and promises should be critically reviewed. NRC and industry projections cited in the "Callaway Safety Evaluation Report" rely heavily on industry information (see Appendix D References in that report).

The "Callaway Safety Evaluation Report" describes fuel rods used in the plant. It states "Each fuel rod is constructed of zirconium alloy tubing containing uranium oxide fuel pellets". This "zirconium alloy tubing" component is also called "zirconium nuclear fuel rod cladding" or just "cladding" (not to be confused with stainless steel reactor cladding and other cladding referred to numerous times in the "Callaway Safety Evaluation Report"). The Callaway "zirconium alloy tubing" is the same component whose history of testing problems described in the "Supporting Information" section below. It is likely that the same zirconium alloys are used in Callaway fuel rods from the same suppliers (Westinghouse, GE Nuclear, and Global Nuclear Fuels) whose problems are described below and in the cited references. NRC statements indicating that they would take no action to review or correct the inaccurate information and records are particular concerns.

A primary function of cladding is to contain the nuclear fuel and fission products (Figure 1) .

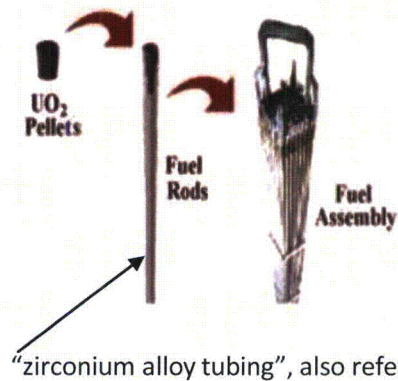


Figure 1. Zirconium alloy tubing of the type used in Callaway nuclear reactors. This component is also referred to as “zirconium fuel rod cladding” or just cladding (not to be confused with reactor vessel cladding referred to in the “Callaway Safety Evaluation Report”. Image source: NRC.

When cladding fails, radioisotopes are released (Figure 2). Hazards of spent fuel radioisotopes and some failures are described in the GAO report.

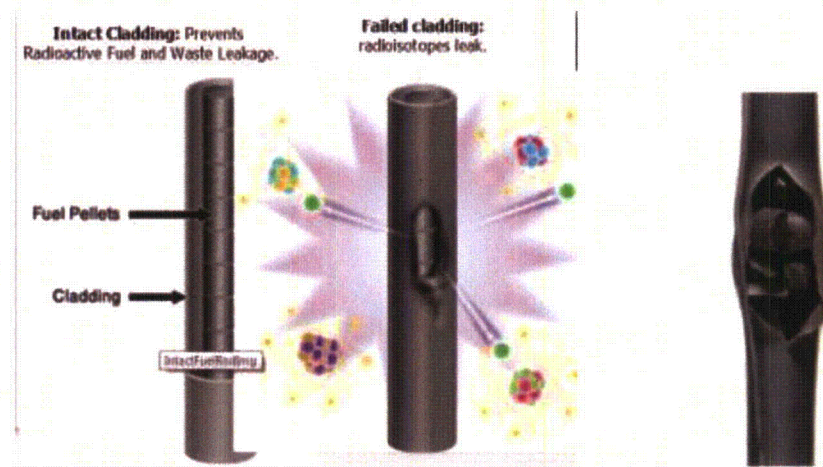
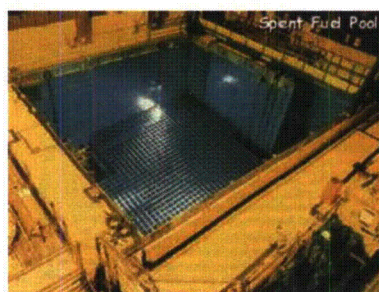


Figure 2. Intact and Failed Zirconium Fuel Rod Cladding (referred to as “zirconium alloy tubing in the Callaway Safety Evaluation Report). Cutaway diagram, diagram showing outsized colored representations of uncontrolled escape of radioisotopes, and photograph of failed zirconium fuel rod cladding from a test. Sources of Images: NRC.

Spent nuclear fuel has been stored in spent fuel pools for decades. During this period, fuel rod cladding is the only component keeping radioisotopes from leaking into coolant water (Figure 3).



BWR Spent Fuel Pool

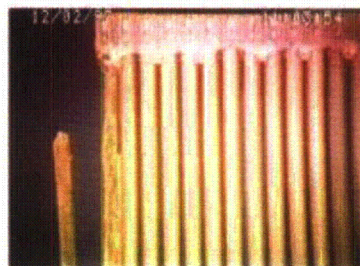
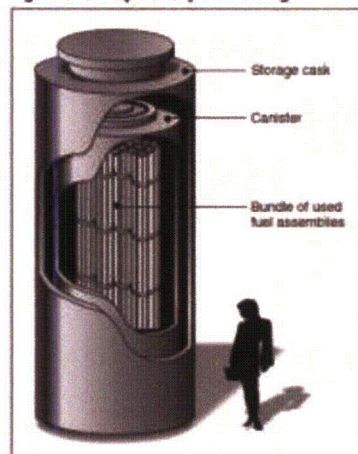


Figure 3. Spent fuel pool and fuel assembly with failed fuel rod cladding. Note that the spent fuel pool shown is not the same type as the spent fuel pool of the Callaway plant. (Image source: NRC.)

After cooling, spent fuel rods are placed in dry storage casks (Figure 4). Different types of casks might be used in the Callaway ISFS. The types of dry storage cask whose testing under flawed the QA system noted in the NRC audit report referenced in the “Supporting Information” below is not known.

As described in below, handling spent fuel rods ISFS

Figure 2: Example of Dry Cask Storage



Source: Nuclear Regulatory Commission

Figure 4. GAO Diagram of bundles of used fuel assemblies containing spent nuclear fuel rods. (Source: GAO. (Ref 2)).

Significant information sources that the NRC and industry rely on to design and manufacture components and to execute the operations described above are suspect. In event of incident or accident, reliance on the same flawed information might lead to critical mistakes at times when good information is needed quickly. The potential safety implications are grave. Academic and other references cited in the “Supporting Information” section describe these problems in more detail.

During the Indian Point relicensing hearing, one judge described poor control of information (not directly related to the cladding information problems described below): “I know we’re not looking at great science”. Although technical limitations are involved, these problems arose mainly due to

limitations in the "human factors" in nuclear safety described by the NRC. The same phrase appropriately describes significant amounts of NRC and industry information on fuel rod cladding of the type used at Callaway: I know we're not looking at great science .

Until the NRC and industry demonstrate that they are relying on "Great Science", no additional activities that will produce more spent nuclear fuel should be allowed. The Callaway license renewal should not be granted.

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Supporting Information:

An Overview of NRC and Nuclear Industry Information Problems: Some Quotes and Excerpts from NRC and Court Records

(The following excerpts can be read in the full context of their source documents. The NRC report and Court decisions are available on-line.)

The NRC's summary of errors appearing in reports of zirconium alloy cladding materials properties:

In summary, the problems associated with Lambda Research's texture analysis, we believe, stem from poor control of specimen preparation, training, software and texture analysis procedures. These deficiencies resulted in "distorted" intensity distributions, and this has been substantiated.

(Source: NRC Allegation NRR-1999-A-0057. ³ Texture Analysis of Zirconium Alloy.)

The NRC's lack of action regarding known errors in reports:

the NRC did not pursue whether distorted results were reported to Lambda's clients.

(Source: NRC Report NRR-1999-A-0057³.)

An NRC report stated the following:

Lambda Research also produced pole figures on several occasions which were indicative of a 90-degree specimen rotation problem.

(Source: NRC Allegation NRR-1999-A-0057 Concerns 1 thru 3. ³ Texture Analysis of Zirconium Alloy Note that court records demonstrate that report results, not specimens, were incorrectly rotated 90 degrees in orientations. The NRC was provided with information indicating that this was a data problem, not a specimen rotation problem. This misleading NRC statement is significant when considered in the context of reviewing for inaccurate information and fraudulent activity in industry.)

GE Nuclear Notification to Lambda Regarding Zirconium Alloy Texture Work:

THE APPLICABLE PROVISIONS OF 10 CFR PT 21, "REPORTING OF DEFECTS AND NON-COMPLIANCES", APPLY TO THIS PROCUREMENT.

THE PRODUCTS AND SERVICES TO WHICH THIS REGULATION APPLIES ARE THOSE WHICH COULD, IF DEFECTIVE OR NONCOMPLIANT, CONTRIBUTE TO SIGNIFICANT RADIOLOGICAL HAZARDS.

(Source: Order. Case No. C-1-00-661. United States District Court for the Southern District of Ohio Western Division. 12-3-01.⁴ The GE Purchase order notification reproduced on page 19 in the decision.)

Zirconium in the Nuclear Industry. 14th International Symposium. Paper on Texture:

"Manufacturing technology used nowadays was to a great extent determined by the relation of texture with physical and mechanical properties of zirconium tubes, their dimensional stability under irradiation, and sensitivity towards stress corrosion cracking." ⁵ (Grytsyna et al. "Destruction of Crystallographic Texture in Zirconium Alloy Tubes." Zirconium in the Nuclear Industry. 14th International Symposium, p 305. Journal of ASTM International, Sept. 2005 Vol 2 No. 8. 12)

Sworn DOL Hearing Testimony from a Physicist Concerning Zirconium Texture Report Errors:

2 Q For the end user, you know, the person who's say
3 operating the nuclear reactor, why is it important to him?
4 A If I were running a nuclear reactor, I would not want
5 anything to fail.

(Source: Case No. 2000-ERA-0035. ALJ Hearing. Testimony. Department of Labor, Office of Administrative Law Judges (ALJ). ⁶)

NRC Conclusion Regarding Safety Implications of Known Report Errors Conflicts with GE Nuclear and Others:

We have
concluded that errors resulting from the texture analysis at Lambda Research in the
development of engineered components is not a safety concern.

(Source: NRC Report NRR-1999-A-0057³.)

Sworn DOL Hearing Testimony from a Physicist Concerning Zirconium Texture Analysis Report Errors:

14 Q Is it a safety problem?
15 A Most definitely.

(Source: Case No. 2000-ERA-0035. ALJ Hearing testimony. Department of Labor, Office of Administrative Law Judges (ALJ). ⁶)

Federal Courts Relied Upon the NRC Report to Make Broad Findings on Nuclear Safety:

However, as the district court correctly remarked, the cited passage from the NRC's report, taken in full proper context, indicated that the precise use to which nuclear energy clients put Lambda's texture analysis data is *irrelevant*, because, as stated in the NRC's letter, in *any* nuclear industry usage, erroneous texture analysis of the zirconium encasement on fuel rods will not have adverse safety consequences.

(Source: United States Court of Appeals for the Sixth Circuit. Case No. 02-3035. Decision On Appeal from the United States District Court for the Southern District of Ohio. ⁷)

A Federal Court Ruling on Falsified Records Concerning Records of Errors in Nuclear Reports:

Lambda did not, as far as the Court can determine, violate any federal, state, or local laws by allegedly attempting to file internally a false quality assurance incident report.

(Order. Case No. C-1-00-661. United States District Court for the Southern District of Ohio Western Division. 12-3-01. ⁴)

Flawed NRC information practices over the decades: Uncertainty and lost records, but not “great science” in 2012 Indian Point Relicensing Board Hearing transcripts excerpts.

“But what this does is leave us with a degree of uncertainty as to exactly what the source for the contaminants that are referred to. It may have been plutonium...but at this point there's no way to really be sure of that.”

³⁸ United States of America Nuclear Regulatory Commission. Atomic Safety and Licensing Board Panel Hearing. Docket Nos. 50-247-LR and 50-286-LR. ASLBP 07-858-03-LR-BD01. In the Matter of: Entergy Nuclear Operations, Inc. (Indian Point Generating Units 2 and 3). Judge McDade. Page 2026.

“We have a gaping hole in the record, and we have no way of knowing what went into these costs.”

³⁸ United States of America Nuclear Regulatory Commission. Atomic Safety and Licensing Board Panel Hearing. Docket Nos. 50-247-LR and 50-286-LR. ASLBP 07-858-03-LR-BD01. In the Matter of: Entergy Nuclear Operations, Inc. (Indian Point Generating Units 2 and 3). Lemay. Page. 2043.)

“So, okay, we lost the reference to 1984. Someone convinced themselves, and then the Staff viewed it as reasonable—and, again, I know we're not looking at great science, but what I'm struggling with is, okay, we lost the reference, but it is 30 years later, and we're trying to deal with a plant-specific analysis for this facility.”

³⁸ United States of America Nuclear Regulatory Commission. Atomic Safety and Licensing Board Panel Hearing. Docket Nos. 50-247-LR and 50-286-LR. ASLBP 07-858-03-LR-BD01. In the Matter of: Entergy Nuclear Operations, Inc. (Indian Point Generating Units 2 and 3). The “Staff” is the NRC staff. Judge Kennedy. Page 2016.

(Further information and references are listed in Reference 9.)

References

¹Safety Evaluation Report With Open Items Related to the License Renewal of Callaway Plant, Unit 1. Docket No. 50-483. (nrc.gov/docs/ML1308/ML13086A224).

²NRC Needs to Do More to Ensure that Power Plants Are Effectively Controlling Spent Nuclear Fuel. United States Government Accountability Office. GAO-05-339. April, 2005.

³NRC Allegation NRR-1999-A-0057 Concerns 1 thru 3. Texture Analysis of Zirconium Alloy. NRC correspondence and report stating that the NRC does not regard known bad texture information to be a safety concern and will not pursue bad data distributed in industry. (A copy has been posted on the Internet at Scribd.com as "NRCAlegationNRR-1999-A-0057".)

⁴ Order. Case No. C-1-00-661. United States District Court for the Southern District of Ohio Western Division. 12-3-01. A copy has been posted on the Internet at Scribd.com as "USDistCtCaseC1No00661".

⁵ Grytsyna et al. "Destruction of Crystallographic Texture in Zirconium Alloy Tubes." Zirconium in the Nuclear Industry. 14th International Symposium, p 305. Journal of ASTM International, Sept. 2005 Vol 2 No. 8. For more information, see also: H. M. Chung, R. S. Daum, J. M. Hiller, and M. C. Billone , "Characteristics of Hydride Precipitation and Reorientation on Spent-Fuel Cladding". Zirconium in the Nuclear Industry. 13th International Symposium, 2002, P. 449.

⁶ Case No. 2000-ERA-0035. ALJ Hearing testimony. Department of Labor, Office of Administrative Law Judges (ALJ).

⁷ United States Court of Appeals for the Sixth Circuit. Case No. 02-3035. Decision. On Appeal from the United States District Court for the Southern District of Ohio. A copy has been posted on the Internet at Scribd.com as "USCourtAppeals6thDistrictCase02No3035".

⁸ United States of America Nuclear Regulatory Commission. Atomic Safety and Licensing Board Panel Hearing. Docket Nos. 50-247-LR and 50-286-LR. ASLBP 07-858-03-LR-BD01. In the Matter of: Entergy Nuclear Operations, Inc. (Indian Point Generating Units 2 and 3).

⁹ "Limited Appearance Statement" on the Renewal of the Licenses for the Indian Point Energy Center, which is posted on the NRC ADAMS database with Accession Number ML12270A373.