

**McCloskey, Bridin**

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**From:** Samuel Miranda <sm973@caa.columbia.edu>  
**Sent:** Wednesday, September 13, 2017 8:44 AM  
**To:** McCree, Victor; Vietti-Cook, Annette  
**Subject:** [External\_Sender] Enforcement Petition (10 CFR §2.206) Regarding Plant Lifetime Extensions

13 September 2017

Mr. Victor M. McCree, Executive Director for Operations

U.S. Nuclear Regulatory Commission,

Washington, DC 20555-0001

By email: [victor.mccree@nrc.gov](mailto:victor.mccree@nrc.gov) Executive Director for Operations

[Annette.vietti-cook@nrc.gov](mailto:Annette.vietti-cook@nrc.gov) Office of the Secretary, US NRC

**SUBJECT:**

Enforcement Petition (10 CFR §2.206) Regarding Plant Lifetime Extensions

Samuel Miranda (the Petitioner) hereby submits this Petition, pursuant to the terms of 10 CFR §2.206, regarding the renewal of operating licenses (i.e., extension of plant operating lifetimes). The Petitioner's relevant background is briefly described in the Appendix.

This Petition pertains to the NRC's license renewals for more than 80 plants, including the following plants:

Plant Name and Unit(s)	Application Received	Renewed License Issued	Date Entering Extended Operation
Arkansas Nuclear One 1	02/01/00	06/20/01	05/20/14
Arkansas Nuclear One 2	10/15/03	06/30/05	07/17/18

<b>Plant Name and Unit(s)</b>	<b>Application Received</b>	<b>Renewed License Issued</b>	<b>Date Entering Extended Operation</b>
Beaver Valley 1 & 2	08/28/07	11/05/09	01/29/16 (Unit 1) 05/27/27 (Unit 2)
Braidwood 1 & 2	05/29/13	01/27/16	10/17/26 (Unit 1) 12/18/27 (Unit 2)
Browns Ferry 1, 2 & 3	01/02/04	05/04/06	12/20/13 (Unit 1) 06/28/14 (Unit 2) 07/02/16 (Unit 3)
Brunswick 1 & 2	10/18/04	06/26/06	09/08/16 (Unit 1) 12/27/14 (Unit 2)
Byron 1 & 2	05/29/13	11/19/15	10/31/24 (Unit 1) 11/06/26 (Unit 2)
Callaway 1	12/19/11	03/06/15	10/18/24
Calvert Cliffs 1 & 2	04/10/98	03/23/00	07/31/14 (Unit 1) 08/13/16 (Unit 2)
Catawba 1 & 2	06/14/01	12/05/03	12/05/23 (Unit 1) 12/05/23 (Unit 2)
Columbia Generating Station	01/20/10	05/22/12	12/20/23
Cooper	09/30/08	11/29/10	01/18/14
D.C. Cook 1 & 2	10/31/03	08/30/05	10/25/14 (Unit 1) 12/23/17 (Unit 2)
Davis-Besse 1	08/30/10	12/08/15	04/22/17
Dresden 2 & 3	01/03/03	10/28/04	12/22/09 (Unit 2) 01/12/11 (Unit 3)
Duane Arnold	10/01/08	12/16/10	02/21/14
Edwin I. Hatch 1 & 2	03/01/00	06/15/02	08/06/14 (Unit 1) 06/13/18 (Unit 2)
Fermi, Unit 2	04/30/14	12/15/16	03/21/25
FitzPatrick	07/01/06	09/08/08	10/17/14
Grand Gulf 1	11/01/11	12/01/16	11/02/24
H.B. Robinson 2	06/17/02	04/19/04	07/31/10
Harris 1	11/16/06	12/17/08	10/24/26
Hope Creek 1	08/18/09	07/20/11	04/11/26
Joseph M. Farley 1 & 2	09/15/03	05/12/05	06/25/17 (Unit 1) 03/31/21 (Unit 2)
LaSalle 1 & 2	12/09/14	10/19/16	04/17/22 (Unit 1) 12/16/23 (Unit 2)
Limerick 1 & 2	06/22/11	10/20/14	10/26/24 (Unit 1) 06/22/29 (Unit 2)
McGuire 1 & 2	06/14/01	12/05/03	06/12/21 (Unit 1) 03/03/23 (Unit 2)
Millstone 2 & 3	01/22/04	11/28/05	07/31/15 (Unit 2) 11/25/25 (Unit 3)
Monticello	03/24/05	11/08/06	09/08/10
Nine Mile Point 1 & 2	05/27/04	10/31/06	08/22/09 (Unit 1) 10/31/26 (Unit 2)



<b>Plant Name and Unit(s)</b>	<b>Application Received</b>	<b>Renewed License Issued</b>	<b>Date Entering Extended Operation</b>
North Anna 1 & 2	05/29/01	03/20/03	04/01/18 (Unit 1) 08/21/20 (Unit 2)
Oconee 1, 2 & 3	07/07/98	05/23/00	02/06/13 (Unit 1) 10/06/13 (Unit 2) 07/19/14 (Unit 3)
Oyster Creek	07/22/05	04/08/09	04/09/09
Palisades	03/31/05	01/17/07	03/24/11
Palo Verde 1, 2 & 3	12/15/08	04/22/11	06/01/25 (Unit 1) 04/24/26 (Unit 2) 11/25/27 (Unit 3)
Peach Bottom 2 & 3	07/02/01	05/07/03	08/08/13 (Unit 2) 07/02/14 (Unit 3)
Pilgrim 1	01/27/06	05/29/12	06/08/12
Point Beach 1 & 2	02/26/04	12/22/05	10/05/10 (Unit 1) 03/08/13 (Unit 2)
Prairie Island 1 & 2	04/15/08	06/27/11	08/09/13 (Unit 1) 10/29/14 (Unit 2)
Quad Cities 1 & 2	03/03/03	10/28/04	12/14/12 (Unit 1) 12/14/12 (Unit 2)
R.E. Ginna	08/01/02	05/19/04	09/18/09
Salem 1 & 2	08/18/09	06/30/11	08/13/16 (Unit 1) 04/18/20 (Unit 2)
Sequoyah 1 & 2	01/15/13	09/24/15	09/17/20 (Unit 1) 09/15/21 (Unit 2)
St. Lucie 1 & 2	11/30/01	10/02/03	03/01/16 (Unit 1) 04/06/23 (Unit 2)
Surry 1 & 2	05/29/01	03/20/03	05/25/12 (Unit 1) 01/29/13 (Unit 2)
Susquehanna 1 & 2	09/13/06	11/17/09	07/17/22 (Unit 1) 03/23/24 (Unit 2)
Three Mile Island 1	01/08/08	10/22/09	04/19/14
Turkey Point 3 & 4	09/11/00	06/06/02	07/19/12 (Unit 3) 04/10/13 (Unit 4)
V.C. Summer	08/06/02	04/23/04	08/06/22
Vogtle 1 & 2	06/29/07	06/03/09	01/16/27 (Unit 1) 02/09/29 (Unit 2)
Wolf Creek 1	10/04/06	11/20/08	03/11/25
Diablo Canyon 1 & 2	11/24/09	under review	n/a
Indian Point 2 & 3	04/30/07	under review	n/a
River Bend	05/31/17	under review	n/a
Seabrook 1	06/01/10	under review	n/a
South Texas Project 1 & 2	10/28/10	under review	n/a
Waterford 3	03/23/16	under review	n/a



The designs of all Pressurized Water Reactors (PWRs) must meet the requirements of [1]. The designs of all Boiling Water Reactors (BWRs) must meet the requirements of [2]. All the postulated events are grouped into four categories, each of which is defined according to its expected frequency of occurrence.

Condition I, or Normal Operation: Operations that are expected frequently or regularly in the course of power operation, refueling, maintenance, or maneuvering of the plant

Condition II, or Incidents of Moderate Frequency: Incidents, any one of which may occur during a calendar year for a particular plant

Condition III, or Infrequent Incidents: Incidents, any one of which may occur during the lifetime of a particular plant

Condition IV, Limiting Faults: Faults that are not expected to occur but are postulated because their consequences would include the potential for the release of significant amounts of radioactive material

The specified frequency of occurrence (Freq) for each of these categories may be expressed in this manner:

Freq(I)  $\geq 1/\text{reactor-year}$

Freq(II)  $\geq 0/\text{reactor-year}$

Freq(III)  $\leq 1/\text{plant-lifetime}$

Freq(IV)  $= 0/\text{plant-lifetime}$

Although PWRs and BWRs were originally licensed for a maximum lifetime of 40 years, their authorized lifetimes can be shortened by the occurrence of too many Condition I events (e.g., thermal or pressure transients). On the other hand, authorized plant lifetimes can be lengthened, via the license renewal process, to a maximum of 60 years. So far, more than 80 plants have had their operating licenses extended, more than half of which have begun operation in their extended license periods.

10 CFR § 50.92, *Issuance of amendment*, specifies that a proposed license amendment (e.g., a license renewal, would not pose a significant hazard if, *operation of the facility in accordance with the proposed amendment would not involve a significant increase in the probability of an accident previously evaluated.*

So, it follows that an extension of the operating lifetime by 20 years (i.e., by 50%) will cause an increase in the frequency of Infrequent Incidents, by 50%. In other words, a license renewal will significantly increase the probability of a previously evaluated (Condition III) accident. Consequently, an applicant for a license renewal cannot truthfully claim there is *no significant hazard* associated with the proposed license renewal.

Since increasing the authorized operating lifetime of a plant increases its frequency of occurrence of Condition III events, it is necessary to make some change (e.g., in plant design or operation) in order to reduce the

frequency of occurrence of Condition III events to the value that is specified in the original operating license. That is, an extension in a plant's operating lifetime requires the applicant to make a change that will decrease the frequency of occurrence of Condition III events from  $\leq 1/40$  reactor-years to  $\leq 1/60$  reactor-years.

It is not sufficient to claim that there will be no *significant increase in the probability of an accident previously evaluated* merely because the applicant does not propose to make any change in the plant's design or operation.

The Petitioner requests the NRC to take the following actions to compel licensees to show for each of their respective plants, that  $\text{Freq(III)} \leq 1/(\text{extended plant-lifetime})$ :

- (1) Suspend Licensees' authorizations to operate their plants for any periods beyond their originally licensed plant lifetimes until they can demonstrate that their license renewals will not cause a *significant increase in the probability of an accident previously evaluated*, particularly with respect to Condition III events.
- (2) Suspend the review of Licensees' applications for authorizations to operate their plants for any periods beyond their originally licensed plant lifetimes until they can demonstrate that their license renewals will not cause a *significant increase in the probability of an accident previously evaluated*, particularly with respect to Condition III events.
- (3) Allow licensees, who are already operating their plants past their originally licensed plant lifetimes, a maximum of one year from the date of this Petition, to submit a plan, and schedule that will produce a verifiable demonstration that continued operation of their plants will not cause a *significant increase in the probability of an accident previously evaluated*, particularly with respect to Condition III events.

#### References:

- [1] American Nuclear Society, "Nuclear Safety Criteria for the Design of Stationary Pressurized Water Reactor Plants, ANS-N18.2-1973, La Grange Park, Illinois, August 6, 1973
- [2] American Nuclear Society, ANS-N212, "Nuclear Safety Criteria for the Design of Stationary Boiling Water Reactor Plants, ANS-N212, La Grange Park, Illinois, May, 1974

#### Appendix



The Petitioner, Samuel Miranda, holds Bachelor's and Master's degrees in nuclear engineering from Columbia University, and a Professional Engineer's license in mechanical engineering, issued by the Commonwealth of Pennsylvania.

He has more than 40 years of experience in reactor safety analysis and licensing at Westinghouse and the NRC.

At Westinghouse (25 years), he worked in their Nuclear Safety Department, where he performed nuclear safety analyses of Westinghouse plants, CE-designed plants, and Soviet VVER plants to resolve reactor safety questions, to improve nuclear power plant operability, and to support the licensing of nuclear plant modifications, core reloads, and changes in operating procedures. He also developed standards and methods for use in nuclear safety analysis, and automatic reactor protection systems design. His work in reactor protection systems design included the preparation of functional requirements, component sizing, and determination of setpoints, time response limits, and Technical Specification revisions. In the 1980s, the Petitioner managed a program, for more than 30 utilities in the Westinghouse Owners Group, to develop a system to improve power plant availability and safety by reducing the frequency of unnecessary automatic reactor trips (see patent no. 4,832,898).

At the NRC (14 years), the Petitioner worked in NRR's Division of Safety Systems (DSS), where he reviewed license amendment requests (LARs) for license renewals, power upratings, and modifications of protection systems in PWR and BWR reactor systems. This included presenting and defending review results before the Advisory Committee on Reactor Safeguards (ACRS). He also revised several sections of the Standard Review Plan (NUREG-0800), and presented the revised versions to the ACRS. The Petitioner retired from the NRC in mid-2014, at grade GG-15.

Please contact the Petitioner for additional details.

With respect and concern,

Samuel Miranda, PE

[sm973@caa.columbia.edu](mailto:sm973@caa.columbia.edu)