

May 18, 2023

Beth E. Heline, General Counsel
Indiana Utility Regulatory Commission
101 West Washington Street, Suite 1500 E
Indianapolis, Indiana 46204
bheline@urc.in.gov
URCComments@urc.in.gov
Electronically delivered

Re: Comments on IURC Rulemaking #22-05

Dear General Counsel Heline,

We appreciate the opportunity to comment on the Commission's small modular nuclear reactors ("SMR") rulemaking strawman draft proposed rule, IURC RM #22-05. Overall, the proposed rules will provide the Commission, the utility, and other parties in interest with guidance that will lead to an efficient process for an SMR petition. However, the strawman rules are not yet complete.

We offer the attached limited number of amendments that ensure the Commission's rule will serve the public interest and adequately protect customers from the immaturity and expected price escalations of the SMR technology.

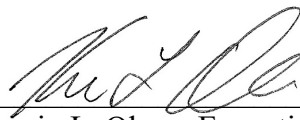
Notably, no nuclear power plant has ever been built within original cost estimates or timeframes,ⁱ including most recent attempts.ⁱⁱ And, **SMR risks to ratepayers are substantial and are shaping up to mirror experience with larger nuclear units in the United States.** The SMR design that is furthest along in the Nuclear Regulatory Commission approval process is the NuScale light-water reactor design. However, the company has steadily reapplied with higher output designs, the most recent increasing the megawatt capacity from 50 to 77 megawatts, essentially starting at square one. In 2015, its initial design was estimated to cost [\\$3 billion](#). That rose to [\\$6.1 billion](#) in 2020. Now, NuScale's partner Utah Associated Municipal Power Systems (UAMPS), which has agreed to purchase power from the first NuScale first-of-its-kind project, has [estimated the cost for 6 reactors \(462 MWs\)](#) to cost \$9.3 billion, up from more than \$5 billion in 2021.

In November 2022, NRC staff issued a [Preapplication Readiness Report](#) for NuScale's 77-megawatt unit. This is an informal process where a nuclear developer can ask staff to review information prior to it being formally submitted. In NuScale's case, this is a Standard Design Approval where staff signs off on the design, but new information can challenge any approval. The next step would be to file for a construction and operating license. The staff's response consists of 23 pages, with 99 issues. These include significant safety issues, such as the materials used in the reactor vessel that houses the fuel and deficiencies in the "loss of coolant accident" analysis, which is when the reactor is no longer being cooled which can lead to a severe accident. NRC staff writes:

Overall, the staff has identified several challenging and/or significant issues that could be focus areas for the SDAA (Standard Design Approval Application) acceptance and/or safety review. While there has been some early engagement on these topics, the staff would encourage continued engagement on these topics until the SDAA's submittal.

In recognition of these realities, CAC asks the Commission to please adopt our recommended rule changes. Thank you very much for this opportunity. We look forward to the issuance of the final rule. Please feel free to contact me with any questions or concerns.

Respectfully,



Kerwin L. Olson, Executive Director
Citizens Action Coalition of Indiana
1915 W. 18th Street, Suite C
Indianapolis, Indiana 46202
317-735-7727
kolson@citact.org

ⁱ U.S. Department of Energy Office, *Analysis of nuclear power plant construction costs*, available at <https://www.osti.gov/biblio/6071600>. Notably, in the first wave from construction starts from 1967 through 1977 costs and construction delays escalated even when construction was 90 percent complete.

ⁱⁱ Vogtle Nuclear Plant (GA) costs estimates have risen from \$14.3 billion to, currently, [more than \\$30 billion](#). V.C. Summer Nuclear Plant (SC) costs rose nearly [\\$14 billion](#) and was cancelled. Lee Nuclear Station (Duke Energy) cost estimates rose from [\\$5 to \\$6 billion](#) to [\\$11 billion](#) in 2011. Duke did not receive a construction operating license until 2016 and cancelled the plant after Westinghouse went bankrupt due to its investment in the AP1000 reactor, the technology Duke had earmarked for Lee. The Levy Nuclear Power Plant (FL) experienced \$20 billion in [cost overruns](#) and was cancelled.

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Draft Proposed Rule
LSA Document #23-_____
IURC RM #22-05

DIGEST

Adds 170 IAC 4-11 regarding requirements for certification under IC 8-1-8.5 for the construction, purchase, or lease of small modular nuclear reactors by a public utility. Effective June 30, 2023.

170 IAC 4-11

SECTION 1. 170 IAC 4-11 IS ADDED AS FOLLOWS:

170 IAC 4-11 Certification Requirements for the construction, purchase, or lease of small modular nuclear reactors by a public utility.

170 IAC 4-11-1 Policy and scope

Authority: IC 8-1-1-3; IC 8-1-8.5-12.1

Affected: IC 8-1-8.5-12.1; IC 8-1-8.8

Sec. 1. This rule is intended to establish procedures and guidelines for a public utility's construction, purchase, or lease of small modular nuclear reactors:

(1) in Indiana for the generation of electricity to be directly or indirectly used to furnish public utility service to Indiana customers; or

(2) at the site of a nuclear energy production or generating facility that supplies electricity to Indiana retail customers on July 1, 2011.

(Indiana Utility Regulatory Commission; 170 IAC 4-11-1)

170 IAC 4-11-2 Applicability under IC 8-1-8.5-12.1

Authority: IC 8-1-1-3; IC 8-1-8.5-12.1

Affected: IC 8-1-8.5-12.1; IC 8-1-8.8

Sec. 2. This rule applies to any public utility, as defined under IC 8-1-8.5-1(a), that petitions the commission for approval of the construction, purchase, or lease of a small modular nuclear reactor to provide utility service to Indiana customers. *(Indiana Utility Regulatory Commission; 170 IAC 4-11-2)*

170 IAC 4-11-3 No change to other commission processes

Authority: IC 8-1-1-3; IC 8-1-8.5-12.1

Affected: IC 8-1-8.5-12.1; IC 8-1-8.8

Sec. 3. This rule does not replace other commission requirements, including, but not limited to:

(1) a proceeding requesting a certificate of public convenience and necessity; and

(2) the commission's rule 170 IAC 4-7 regarding integrated resource planning.

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(Indiana Utility Regulatory Commission; 170 IAC 4-11-3)

170 IAC 4-11-4 Definitions

Authority: IC 8-1-1-3; IC 8-1-8.5-12.1; IC 8-1-8.5-3

Affected: IC 8-1-8.5-12.1; IC 8-1-8.8

Sec. 4. (a) The definitions in IC 8-1-8.5-12.1 and this section apply throughout this rule:

(a) “Commercialization” means a SMR technology that has been proven for broad adoption subsequent to a pilot(s) project(s) and successful demonstration of the technology.

(b) “Commission” means the Indiana utility regulatory commission.

(c) “CPCN” means a certificate of public convenience and necessity, as required under IC 8-1-8.5-2.

(e)(d) “First mover” means a public utility, municipality, rural electric membership cooperative, or non-utility developer, owner, or operator that brings a commercialized SMR technology to market.

~~(d)(e)~~ “High level radioactive waste” has the same definition as in IC 13-11-2-102.

~~(e)(f)~~ “NRC” means the United States Nuclear Regulatory Commission.

~~(f)~~ “OUCC” means the Indiana office of utility consumer counselor established under IC 8-1-1.1.

(g) “Pilot project” means:

(1) the initial project of a first-of-a-kind SMR technology that:

a. has been fully constructed,

b. is generating power; and,

c. whose components have been monitored to determine deficiencies in operation.

(2) is limited to serving one (1) customer.

(h) “Public utility” has the same definition as in IC 8-1-8.5-1(a).

(g)(i) Resource portfolios has the same definition as 170 IAC 4-7-8.

~~(h)(j)~~ “SMR” means a small modular nuclear reactor as defined in IC 8-1-8.5-12.1(a).

(k) “Spent nuclear fuel” has the same definition as in IC 13-11-2-216.

(l) “Successful demonstration project” means an SMR project is the first project subsequent to a pilot project and in which:

(1) the technology has operated without identification of deficiencies in the technology’s components;

(2) the project has not exceeded the initial estimated construction timeframe by more than 10%; and,

(3) the project has not exceeded the initial cost estimate by more than 10%.

(Indiana Utility Regulatory Commission; 170 IAC 4-11-4)

170 IAC 4-11-5 Certificate and additional evidence required

Authority: IC 8-1-1-3; IC 8-1-8.5-12.1

Affected: IC 8-1-8.5-12.1

Commented [J1]: An authority for inserting a first mover definition is due to the excessively long lead-times and costs that it will likely take to actually operate SMR technology in a pilot and, legally, is found in the IRP administration code, including the definition of Preferred Resource Portfolio (170 IAC 4-7-1(cc)) and Risk metric (170 IAC 4-7-1(kk)), as well as certain elements of Resource Portfolios, like risk, uncertainty, and technological change (170 IAC 4-7-8(a)(1)), cost effectiveness (170 IAC 4-7-8(b)(c)(4)(D)), and a description of how the preferred resource portfolio balances cost effectiveness, reliability, and portfolio risk and uncertainty (170 IAC 4-7-8(c)(8)).

Nuclear technology is unique in that, historically, it is taken from diagram to full commercialization, which is one reason costs inevitably escalate and construction delays abound. For comparison, this is not the experience with wind, solar or battery technology. Developers of these generation resources have the advantage of bringing third generation technology to market because it does not cost billions to build a prototype or pilot project. Continuous technological improvement and extensive operational experience have aided in significant cost reductions for these technologies over the last decade – and costs are expected to continue to decline. Costs have never declined for nuclear power. Indeed, as with the NuScale unit, construction costs have always increased way beyond initial estimates. Since NuScale will build its first power plant off diagram and has yet to prove the design and whose construction would be in the earliest phases of the technology, the project is more like a pilot project at the pre-commercialization stage. In other words, the pilot is an experiment to determine if the technology will function properly and to determine what deficiencies there may be and if they can be corrected. Ratepayers should be at front of mind for these types of projects.

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Sec. 5. (a) A public utility that seeks to construct, purchase, lease, or otherwise own or operate an SMR must first obtain a CPCN from the commission pursuant to IC 8-1-8.5.

(b) As part of its case-in-chief and in addition to the evidence required to support the CPCN factors listed in IC 8-1-8.5-4 and IC 8-1-8.5-5, the public utility must provide evidence regarding the following:

(1) Whether, and to what extent, the one (1) or more SMRs proposed by the public utility will replace a loss of generating capacity in the public utility's portfolio resulting from the retirement or planned retirement of one (1) or more of the public utility's existing electric generating facilities that:

- (A) are located in Indiana; and
- (B) use coal or natural gas as a fuel source;

(2) Whether one (1) or more of the SMRs that will replace an existing facility will be located on the same site as or near the existing facility and, if so, potential opportunities for the public utility to:

- (A) make use of any land and existing infrastructure or facilities already owned or under the control of the public utility; or
- (B) create new employment opportunities for workers who have been, or would be, displaced as a result of the retirement of the existing facility; and

(3) Its plan to apply for all licenses or permits to construct or operate the proposed SMR as may be required by:

- (A) the NRC;
- (B) the Indiana department of environmental management; or
- (C) any other relevant state or federal regulatory agency with jurisdiction over the construction or operation of nuclear generating facilities.

(4) Its plan to document first mover entry into the market of SMR technology.

(5) Its plan for education and community outreach regarding the proposed SMR.

(6) Its plan to document and safe storage of high-level nuclear waste, and to assess the volume, radiation levels and cost of storing high-level nuclear waste.

(7) Its plan to assess the cost of decommissioning of a SMR(s).

(8) Its plan for emergency response and local first responder training.

(9) Its plan for site security and the costs of site security.

(10) Its plan to assess the source and quantity of nuclear fuels to be used over its lifetime.

(11) Its plan to mitigate against forced, or unplanned, outages.

(12) Its plan to assess net utility bill benefits to ratepayers of SMR technology, including:

(A) comparing resource portfolios, as defined under Sec. 1, including, at least, one (1) portfolio that projects no SMR capacity additions and one (1) portfolio that projects no SMR capacity additions or natural gas-fired capacity additions.

(B) comparing portfolios that maximize distributed resources, including wind, solar, solar plus storage, wind plus storage, demand response, and energy efficiency.

(13) Its plan to assess water stress, over a 20-year period, for thermos-electric SMR units with respect to potential impacts on reliability and local economic development

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planning, including sites likely to be suggested for SMR construction such as at existing and closed coal-fired power plants.

(145) Additional guidelines that may be provided in a general administrative order issued by the commission.

(c) The commission may grant a CPCN under circumstances and for locations other than those described in subdivisions (b)(1) and (2). However, if the initially estimated completion date for construction is delayed or estimated to be delayed two years or if construction costs exceed or are estimated to exceed initial estimates by 10% (ten percent), the public utility must file a new CPCN.

(d) The commission may not grant a CPCN to a public utility, if the public utility seeking to construct, own or operate an SMR is a first mover or if the public utility is seeking to lease or purchase an SMR or the output of an SMR from a first mover. (Indiana Utility Regulatory Commission; 170 IAC 4-11-5)

170 IAC 4-11-6 Reports to and from NRC
Authority: IC 8-1-1-3; IC 8-1-8.5-12.1
Affected: IC 8-1-8.5-12.1

Sec. 6. (a) The owner or operator of a proposed or existing SMR shall provide to the commission all docket numbers assigned by the NRC regarding the proposed or existing SMR within 30 days of the docket number being assigned, thus allowing the commission and its staff timely access, in accordance with applicable federal law and regulations, to any:

- (1) reports;**
- (2) notices of violations; or**
- (3) other notifications**

sent to or received from the NRC by or to the owner or operator of a proposed or existing SMR.

(b) To the extent that 10 C.F.R. Part 2 requires documents to be served upon state officials, those documents shall also be provided electronically to the commission either by the NRC or the owner or operator of a proposed SMR, as applicable.

(c) Notices of violation received by the owner or operator of a proposed or existing SMR shall be served upon the commission within fifteen days of receipt of the notice.

(d) If the owner or operator of a proposed or existing SMR submits to the commission a:

- (1) report;**
- (2) notice of violation; or**
- (3) other notification;**

containing information that is considered confidential or exempt from public access and disclosure under state or federal law, the owner or operator of a proposed SMR shall submit the information according to the commission's rules, specifically including 170 IAC 1-1.1-4. **Parties may access confidential documents, subject to normally used confidentiality agreements. Any documents that are not confidential shall be made publicly available on the commission's electronic filing system.**

(e) To the extent that the commission or its staff access, or seek to access, confidential documents in an NRC docket number, they shall comply with federal laws and regulations regarding confidentiality and maintain the confidentiality of such documents for as long as

Commented [J2]: There is no doubt that changing weather patterns have impaired the operation of thermo-electric plants with respect to water availability. And the impacts are expected to increase. In 2020, [S&P Global](#) found that by 2030 water availability issues would impact about:

- 70% of the natural gas power plant fleet;
- 45% of the coal power plant fleet; and,
- 60% of the nuclear power plant fleet.

S&P also found that water risks to coal plants were concentrated in 5 states, Indiana being one of them. In Indiana, by 2030, 8,600 megawatts of coal plant capacity would be threatened – Gibson, Petersburg, Merom and Cayuga, with medium risk, and Schahfer, with high risk.

As utilities generally consider former coal plant locations good sites for SMRs, this could pose a problem in the near future – if light water reactors become the norm, which is the norm for the industry now. With respect to SMR light water reactors, one assessment finds: "A single 300 MW reactor operating at 90 percent capacity factor would withdraw 160 million to 390 million gallons of water *every day*, heating it up before discharge. Reducing the demand for water by using air cooling will require the addition of a tower and large electric fans – further raising the construction cost and reducing output of electricity by up to 7 percent of the capacity of the reactor." <https://www.ewg.org/news-insights/news/why-small-modular-nuclear-reactors-wont-help-counter-climate-crisis>

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the confidentiality restrictions under federal law or regulations apply. Parties may intervene and access confidential documents, subject to normally used confidentiality agreements. (Indiana Utility Regulatory Commission; 170 IAC 4-11-6)

170 IAC 4-11-7 Basic Reporting Requirements

Authority: IC 8-1-1-3; IC 8-1-8.5-3

Affected: IC 8-1-8.5-12.1

Sec. 7. Any person that owns or operates an SMR in Indiana shall report the following information on an annual basis to be, with exception of confidential information, accessible to the public:

- (1) the assessment of the decommissioning cost of a SMR(s);**
- (2) measures for emergency response and local first responder training;**
- (3) measures taken for site security and the costs of site security;**
- (4) the source and volume of nuclear fuels to be used over its lifetime;**
- (5) measures taken to mitigate against forced, or unplanned, outages;**
- (6) for a public utility, the results of assessment of net utility bill benefits to ratepayers of SMR technology by comparing portfolios, as defined under Sec. 1; and**
- (7) results of the water stress assessment.**

170 IAC 4-11-87 Storage of SMR spent nuclear fuel or radioactive waste

Authority: IC 8-1-1-3; IC 8-1-8.5-12.1

Affected: IC 8-1-8.5-12.1

Sec. 87. Any person that owns or operates an SMR in Indiana:

(a) may not store:

- (1) spent nuclear fuel; or**
 - (2) high level radioactive waste;**
- from the SMR on the site of the SMR without first meeting all applicable requirements of the NRC.

(b) must report to the commission on an annual basis measures taken for safe storage of high-level nuclear waste, the volume of high-level nuclear waste generated, the volume of high-level nuclear waste stored, and the cost to store high-level nuclear waste.

(Indiana Utility Regulatory Commission; 170 IAC 4-11-87)

170 IAC 4-11-9 Biennial contemporary issues technical conference

Authority: IC 8-1-1-3; IC 8-1-8.5-3

Affected: IC 8-1-8.5-12.1

Sec. 9. (a) On a biannual basis, beginning in 2023:

- (1) the commission shall host a technical conference to assess, in addition to other contemporary issues the commission deems relevant, technology developments in the energy sector, over a 20-year period, by comparing portfolios of technologies that do not rely on operation from extracted, mined or drilled fuels compared to those that do of current available and near-term available technologies, for both utility-scale**

Commented [J3]: Given the risky nature of SMR technology for ratepayers, the public and policymakers should remain informed. The IRP process provides for a wealth of information regarding energy technology, uncertainties, potential outcomes. From this authority provided to the Commission, we urge the addition of a new section to provide basic reporting requirements to be submitted on an annual basis.

Commented [J4]: CAC urges the Commission to take a more holistic view of technological changes in the energy sector that could inform and assist in steering utility portfolios to the least risky, adequately reliable and adequately affordable options.

Alternatives to utility-scale, conventional power plants are increasingly viewed as portfolios that achieve a number of goals that are cost-effective that include providing reliability services.

As the venerable energy research organization RMI (formerly Rocky Mountain Institute) notes: "RMI research has consistently shown that "clean energy portfolios" (CEPs)—comprising wind, solar, battery storage, energy efficiency, and demand flexibility—are now cost-competitive with new natural gas power plants, while providing the same grid reliability services."

A holistic approach for reviewing these technologies and others can greatly assist and inform the Commission with up-to-date information and decision-making with respect to cost-effectiveness, reliability, environmental concerns, and affordability.

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and distributed energy resource portfolios and mix of those, with respect to the technologies':

(A) current and near-term availability;

(B) current and expected cost trends, including decommissioning costs and high-level nuclear waste storage costs and coal ash regulatory and cleanup costs, and;

(C) long-term commercial viability and their ability to deliver reliable service.

(2) The issues surveyed shall also include an assessment of water stresses, over a 20-year period, for thermo-electric plants with respect to the potential impacts on reliability and local economic development planning at sites, including sites likely to be suggested for SMR construction at existing and closed coal-fired power plant locations.

(b) For purposes of this section, "contemporary issues" has the same definition as 170 IAC 4-7-1(g).

(c) The commission may use a similar structure as in 170 IAC 4-7-2.7.

(d) The commission's public notice provisions apply to this section.