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# NEI White Paper: Using Senior Reactor Operators (SRO) as Limited Senior Reactor Operators (LSRO) at other Nuclear Facilities

Prepared by the Nuclear Energy Institute  
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## 1 INTRODUCTION

This white paper provides an approach to facilitate efficiently licensing current SROs as SROs limited to fuel handling (LSRO), sometimes referred to as Fuel Handling Supervisors (FHS), at other nuclear facilities of similar designs.

## 2 BACKGROUND

This white paper was developed in response to a strategic goal established by the industry through the NEI Licensed Operator Focus Group (LOFG). The strategic goal was to “Develop guidance on how current licensed SROs could be used at other nuclear facilities to direct and oversee fuel handling activities as part of fleet outage support for units that have reactor types of similar designs.” Industry experience indicates that licensing LSROs solely for fuel handling and maintaining separate staffing and training programs are inefficient due to infrequent performance of these activities. As such, there are no nuclear power plants within the existing nuclear fleet that utilize LSRO only training programs.

There continues to be a growing need for nuclear power plant licensees to leverage opportunities that utilize nuclear power plant staff in roles that maximize proficiency in required job functions. Fuel handling activities at a site occur once every refueling cycle (e.g., every 18 or 24 months) therefore there are limited opportunities for SROs to perform these oversight duties. By having current SROs licensed at one facility perform LSRO functions at other similar facilities, efficiencies can be realized that maximize expertise and improve proficiency for these infrequently performed activities.

Senior Reactor Operators (SRO) or Senior Reactor Operators limited to Fuel Handling (LSRO) meet the requirements of 10 CFR 50.54 m(2)(iv), “*Each licensee shall have present, during alteration of the core of a nuclear power unit (including fuel loading or transfer), a person holding a senior operator license, or a senior operator license limited to fuel handling to directly supervise the activity, and, during this time, the licensee shall not assign other duties to this person.*” 10 CFR Part 55 establishes the regulatory requirements to issue licenses to operators and senior operators and the terms and conditions to maintain or renew these licenses. NUREG-1021, Revision 12, “Operator Licensing Examination Standards for Power Reactors” establishes the policies, procedures, and practices for examining licensees and applicants for reactor operator and senior reactor operator licenses at power reactor facilities.

NUREG-1021 rev. 12, ES 7.1, Administration of Initial Examinations for Senior Operators Limited to Fuel Handling, provides specific instructions for use in preparing, administering, grading, and documenting initial examination for senior operators limited to fuel handling (i.e., limited senior reactor operator (LSROs)). ES 7.1 contains an exception to ES-2.2 that allows a facility licensee to request LSRO licenses that are valid for more than one site. To do so, the facility licensee shall document the differences in the design, procedures, technical data, and administrative controls of the separate facilities for which the license is being sought.<sup>1</sup> It also allows with concurrence of the Office of Nuclear Reactor Regulations (NRR) operator licensing program office, the NRC regional office may issue LSRO licenses that are valid for units at more than one site if the units are manufactured by the same vendor and are of similar design.<sup>2</sup> Other exceptions and clarifications are provided for differences between examining SROs and LSROs.

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<sup>1</sup> NUREG-1021, Rev. 12, ES-7.1.B.1.a

<sup>2</sup> NUREG-1021, Rev. 12, ES-7.1.B.2.b

NUREG-1021 rev. 12, ES-7.2, Administration of NRC Requalification Examinations for Senior Operators Limited to Fuel Handling, provides general guidance for facility licensees and instructions for NRC examiners to use in preparing, administering, grading, and documenting NRC conducted requalification examinations for senior operators limited to fuel handling (i.e., limited senior reactor operators (LSROs)).

This white paper recommends a similar or equivalent approach to ES 7.1 & ES 7.2 for current licensed SROs that will allow a facility licensee to request and maintain LSROs licenses at more than one unit while meeting the associated regulatory requirements including how the systematic approach to training (SAT) is used to meeting requalification training requirements.

### 3 SRO/LSRO COMPARISON TABLE AND RECOMMENDED APPROACH

The table below assesses current regulatory guidance and recommendations on how to meet the requirements when utilizing already licensed SROs.

#### 3.1 Table of SRO/LSRO Regulatory Guidance and Recommendations

SRO	LSRO	Differences/Recommendations
<b>10 CFR 50.54m(2)(iv)</b> - Each licensee shall have present, during alteration of the core of a nuclear power unit (including fuel loading or transfer), a person holding a senior operator license, or a senior operator license limited to fuel handling to directly supervise the activity, and, during this time, the licensee shall not assign other duties to this person.		<ul style="list-style-type: none"> <li>No differences. LSROs and SROs both meet the regulations for directly supervising fuel handling activities.</li> </ul>
<b>10 CFR Part 55.2(b)</b> - Any individual designated by a facility licensee to be responsible for directing any licensed activity of a licensed operator.		<ul style="list-style-type: none"> <li>LSROs are limited to fuel handling activities only. SROs have a broader scope including fuel handling activities.</li> </ul>
<b>10 CFR 55.3</b> - A person must be authorized by a license issued by the Commission to perform the function of an operator or a senior operator as defined in this part.		<ul style="list-style-type: none"> <li>No differences. LSROs and SROs must possess licenses issued by the Commission.</li> </ul>
<b>10 CFR 55.11 Specific exemptions</b> - The Commission may, upon application by an interested person, or upon its own initiative, grant such exemptions from the requirements of the regulations in this part as it determines are authorized by law and will not endanger life or property and are otherwise in the public interest.		<ul style="list-style-type: none"> <li>Specific exemptions are available if warranted.</li> </ul>
<b>10 CFR 55.13 General exemptions</b> - The regulations in this part do not require a license for an individual who -- (a) Under the direction and in the presence of a licensed operator or senior operator, manipulates the controls of -- (1) A research or training reactor as part of the individual's training as a student, or (2) A facility as a part of the individual's training in a facility licensee's training program as approved by the		<ul style="list-style-type: none"> <li>55.13(b) is a well-established general exemption that allows non-licensed operators to perform fuel loading/unloading and transfer operations under the direction and presence of a licensed senior operator. This is met by either a LSRO or SRO.</li> </ul>

SRO	LSRO	Differences/Recommendations
<p>Commission to qualify for an operator license under this part.</p> <p>(b) Under the direction and in the presence of a licensed senior operator, manipulates the controls of a facility to load or unload the fuel into, out of, or within the reactor vessel.</p>		
<p><b>10 CFR 55 Subpart C – Medical Requirements</b></p>		<ul style="list-style-type: none"> <li>No differences in meeting medical requirements.</li> </ul>
<p><b>10 CFR 55 Subpart D - Applications</b></p>		<ul style="list-style-type: none"> <li>Similar methods when applying for and dispositioning initial applications.</li> </ul>
<p><b>10 CFR 55.47 Waiver of examination and test requirements.</b></p> <p>(a) On application, the Commission may waive any or all of the requirements for a written examination and operating test, if it finds that the applicant --</p> <p>(1) Has had extensive actual operating experience at a comparable facility, as determined by the Commission, within two years before the date of application;</p> <p>(2) Has discharged his or her responsibilities competently and safely and is capable of continuing to do so; and</p> <p>(3) Has learned the operating procedures for and is qualified to operate competently and safely the facility designated in the application.</p> <p>(b) The Commission may accept as proof of the applicant's past performance a certification of an authorized representative of the facility licensee or of a holder of an authorization by which the applicant was previously employed. The certification must contain a description of the applicant's operating experience, including an approximate number of hours the applicant operated the controls of the facility, the duties performed, and the extent of the applicant's responsibility.</p> <p>(c) The Commission may accept as proof of the applicant's current qualifications a certification of an authorized representative of the facility licensee or of a holder of an authorization where the applicant's services will be utilized.</p>		<ul style="list-style-type: none"> <li>Waivers under 10 CFR 55.47 may have increased applicability for current licensed SROs applying for LSRO license(s) at comparable facilities. Will be discussed further during NUREG-1021 assessment below.</li> </ul>
<p><b>10 CFR 55.53 Conditions of licenses.</b></p> <p>Each license contains and is subject to the following conditions whether stated in the license or not:</p> <p>(a) Neither the license nor any right under the license may be assigned or otherwise transferred.</p> <p>(b) The license is limited to the facility for which it is issued.</p>		<ul style="list-style-type: none"> <li>Need to address 55.53 (b), (c) to determine if an SRO license for one facility can include limitations of an LSRO of another facility or if an exemption or multiple licenses will be required. NUREG-1021 provides provisions for multiples units to be included under the LSRO license. Will be discussed further during NUREG-1021 assessment below.</li> </ul>

SRO	LSRO	Differences/Recommendations
<p>(c) The license is limited to those controls of the facility specified in the license.</p> <p>(d) The license is subject to, and the licensee shall observe, all applicable rules, regulations, and orders of the Commission.</p> <p>(e) If a licensee has not been actively performing the functions of an operator or senior operator, the licensee may not resume activities authorized by a license issued under this part except as permitted by paragraph (f) of this section. To maintain active status, the licensee shall actively perform the functions of an operator or senior operator on a minimum of seven 8-hour or five 12-hour shifts per calendar quarter. For test and research reactors, the licensee shall actively perform the functions of an operator or senior operator for a minimum of four hours per calendar quarter.</p> <p>(f) If paragraph (e) of this section is not met, before resumption of functions authorized by a license issued under this part, an authorized representative of the facility licensee shall certify the following:</p> <p>(1) That the qualifications and status of the licensee are current and valid; and</p> <p>(2) That the licensee has completed a minimum of 40 hours of shift functions under the direction of an operator or senior operator as appropriate and in the position to which the individual will be assigned. The 40 hours must have included a complete tour of the plant and all required shift turnover procedures. For senior operators limited to fuel handling under paragraph (c) of this section, one shift must have been completed. For test and research reactors, a minimum of six hours must have been completed.</p> <p>(g) The licensee shall notify the Commission within 30 days about a conviction for a felony.</p> <p>(h) The licensee shall complete a requalification program as described by § 55.59.</p> <p>(i) The licensee shall have a biennial medical examination.</p> <p>(j) The licensee shall not consume or ingest alcoholic beverages within the protected area of power reactors, or the controlled access area of non-power reactors. The licensee shall not use, possess, or sell any illegal drugs. The licensee shall not perform activities authorized by a license issued under this part while under the influence of alcohol or any prescription, over-the-counter, or illegal substance that could adversely affect his or her ability to safely and competently perform his or her licensed duties. For the purpose of this paragraph, with respect to alcoholic beverages and drugs, the term</p>		<ul style="list-style-type: none"> <li>• Actions under 55.53 (f) are different between SROs and LSROs returning to active status if the other 55.53(e) requirements are not satisfied.</li> <li>• SROs with separate LSRO licenses or provisions would need to demonstrate completion of a requalification program as described in 55.53(e). As part of this proposal, elements of the requalification program would be satisfied by the incumbents' existing SRO training program with any additional requirements being satisfied by additional training and evaluation being systematically determined to ensure that any differences in design, procedures, technical data, and administrative controls are addressed.</li> </ul>

SRO	LSRO	Differences/Recommendations
<p>"under the influence" means the licensee exceeded, as evidenced by a confirmed test result, the lower of the cutoff levels for drugs or alcohol contained in subparts E, F, and G of part 26 of this chapter, or as established by the facility licensee. The term "under the influence" also means the licensee could be mentally or physically impaired as a result of substance use including prescription and over-the-counter drugs, as determined under the provisions, policies, and procedures established by the facility licensee for its fitness-for-duty program, in such a manner as to adversely affect his or her ability to safely and competently perform licensed duties.</p> <p>(k) Each licensee at power reactors shall participate in the drug and alcohol testing programs established pursuant to 10 CFR part 26. Each licensee at non-power reactors shall participate in any drug and alcohol testing program that may be established for that non-power facility.</p> <p>(l) The licensee shall comply with any other conditions that the Commission may impose to protect health or to minimize danger to life or property.</p>		
<p><b>10 CFR 55.59 Requalification.</b></p> <p>(a) Requalification requirements. Each licensee shall —</p> <p>(1) Successfully complete a requalification program developed by the facility licensee that has been approved by the Commission. This program shall be conducted for a continuous period not to exceed 24 months in duration.</p> <p>(2) Pass a comprehensive requalification written examination and an annual operating test.</p> <p>(i) The written examination will sample the items specified in §§ 55.41 and 55.43 of this part, to the extent applicable to the facility, the licensee, and any limitation of the license under § 55.53(c) of this part.</p> <p>ii) The operating test will require the operator or senior operator to demonstrate an understanding of and the ability to perform the actions necessary to accomplish a comprehensive sample of items specified in § 55.45(a) (2) through (13) inclusive to the extent applicable to the facility.</p> <p>(c) Requalification program requirements. A facility licensee shall have a requalification program reviewed and approved by the Commission and shall, upon request consistent with the Commission's inspection program needs, submit to the Commission a copy of its comprehensive requalification written examinations or annual operating tests. The requalification program must meet the requirements of paragraphs (c) (1) through (7) of this section. In lieu of</p>		<ul style="list-style-type: none"> <li>SROs must meet requalification program requirements of (c)(1) through (c)(7) as described in this section. (c)(2), (3), and (4) are typically met through using a systematic approach to training (SAT) through an accredited INPO training program. LSROs would need to meet the same requirements. SROs licensed as LSRO at other stations would need to ensure their program demonstrates how these requirements are met for both the SRO and applicable LSRO elements. This will be further discussed during NUREG-1021 assessment below.</li> </ul>

SRO	LSRO	Differences/Recommendations
<p>paragraphs (c) (2), (3), and (4) of this section, the Commission may approve a program developed by using a systems approach to training.</p> <p>(1) Schedule. The requalification program must be conducted for a continuous period not to exceed two years, and upon conclusion must be promptly followed, pursuant to a continuous schedule, by successive requalification programs.</p> <p>(2) Lectures.</p> <p>3) On-the-job training.</p> <p>(4) Evaluation.</p> <p>(5) Records.</p> <p>(6) Alternative training programs</p> <p>(7) Applicability to research and test reactor facilities</p>		
<p><b>NUREG 1021, ES- 7.1 - B. Responsibilities.</b> 1. Facility Licensee. The facility licensee is responsible for the same activities specified in the examination standards for unrestricted licenses, with the following exceptions and modifications:</p> <p>a. As an exception to ES-2.2, the facility licensee may request LSRO licenses that are valid for more than one site. To do so, the facility licensee shall document the differences in the design, procedures, technical data, and administrative controls of the separate facilities for which the license is being sought.</p>		<p>There are no provisions in NUREG-1021 that describe if/how an SRO can request LSRO licenses that are valid for more than one site similar to LSRO licenses. May need to request a specific exemption separately or have additional LSRO licenses.</p>
<p><b>NUREG 1021, ES 7-1 - 2. NRC Regional Office.</b> The NRC regional office is responsible for the same activities specified in the unrestricted examination standards, with the following exceptions and modifications:</p> <p>a. The NRC regional office should generally conduct the LSRO examinations during a time when the fuel handling equipment will be available for the operating tests.</p> <p>b. With the concurrence of the Office of Nuclear Reactor Regulation (NRR) operator licensing program office, the NRC regional office may issue LSRO licenses that are valid for units at more than one site if the units are manufactured by the same vendor and are of similar design. The applicant must pass an examination that addresses the differences in the design, procedures, technical data, and administrative controls of the separate facilities for which the license is being sought.</p>		<p>Since LSRO licenses will be sought for current SRO's, it should be unnecessary to conduct an LSRO examination during a time when fuel handling equipment will be available for the operating test. Current licensed SROs should only need to pass an examination (e.g., written) that addresses the differences in the design, procedures, technical data, and administrative controls of the separate facilities for which the license is being sought as described under sect. b. Additionally, a similar provision for issuing LSRO licenses that are valid for units at more than one site should be applied to current SROs obtaining LSRO licenses.</p>
<p><b>NUREG 1021, ES-2.2</b> – In accordance with 10 CFR 55.47, “Waiver of examination and test requirements,” an applicant may request waiver of a written examination or an operating test requirement. Specifically, the NRC may waive any or all of the examination and test</p>		<p>Currently licensed SROs should be able to request a waiver for specific LSRO examination elements.</p>

SRO	LSRO	Differences/Recommendations
requirements if it determines that the applicant has presented sufficient justification.		
<p><b>NUREG-1021, ES 5.3. Maintaining, Changing, and Renewing Operator Licenses</b> - Step A.1 describes steps to maintain an operator license through requalification and testing.</p> <p>Step A.2 describes steps to meet proficiency watches. Step h recognizes LSROs would generally be unable to maintain an active status as defined in 10 CFR 55.53(e) and provides guidance on meeting 10 CFR 55.53(f) requirements to reactivate an LSRO license or request a specific exemption under 10 CFR 55.11 provided such exemption from the regulatory requirements are authorized by law and will not endanger life or property and are otherwise in the public interest.</p>		<p>Maintaining or reactivating an active SRO license should satisfy LSRO license and proficiency requirements, as long as the other elements of the SAT based requalification program for the LSRO are also met.</p>
<p><b>NUREG-12021, ES 5.3.3. Medical Standards</b> - describes the medical requirements for licensed operators.</p>		<p>While these are the same for SROs and LSROs, provisions to align requirements for physical examinations, reporting medical conditions, etc., should occur to prevent unnecessary duplication and overlapping of various elements that maintain licenses.</p>

## 3.2 Recommended Approach

### 3.2.1 Current SRO seeking LSRO license at Comparable Facility

1. Complete SAT based training that focuses on the differences in design, procedures, technical data, and administrative controls of the separate facility for which the LSRO license is being sought. Refer to ACAD 10-001 and plant-specific job and task analyses.
2. Apply for LSRO license referring to NUREG-1021 focusing on ES. 7.1 documenting the differences in the design, procedures, technical data, and administrative controls of the separate facilities for which the license is being sought. This may include waivers for specific operating testing requirements based on current SRO license. Refer to Attachment 1, LSRO Application Template.
3. **Option 1 (preferred):** Current SRO license is modified to include LSRO elements and limitations.

This option is preferred to synchronize license expirations, physical, and other requirements to efficiently demonstrate maintenance of current SRO license to meet proficiency requirements of active LSRO status and would aid in efficient NRC oversight and inspection. For example, verification of elements to maintain current SRO license and meeting requalification requirements via biennial written exam, just-in-time training and evaluation through SAT to demonstrate requalification program requirements for LSRO license requirements.

4. **Option 2 (alternative):** An additional LSRO license is issued for comparable facilities.

This option may be more complex to maintain and manage. May need to demonstrate active status differently or request specific exemption(s) to credit active SRO license elements to reduce duplicative requirements.

5. Maintain requalification program requirements for LSRO license by completing SRO license requalification program requirements and additional LSRO elements for the comparable facility not to exceed two years. For example,
  - Take LSRO written exam at the same time as SRO requalification exam to keep synchronized.
  - Take LSRO written exam prior to fulfilling LSRO activities as part of SAT based just-in-time training/examination not to exceed two years.
  - Request exemption not to meet 2-year requalification examination requirements for LSRO license crediting maintenance of SRO license.

## 4 DOCUMENT REFERENCES

### 4.1 References

1. 10 CFR 50.54m(2)(iv)
2. 10 CFR Part 55, Operator Licenses.
3. NUREG-1021 Revision 12, Operator Licensing Examination Standards for Power Reactors.
4. ACAD 10-001, Guidelines for Initial Training and Qualifications of Licensed Operators.

## 5 ATTACHMENTS

### 5.1 Attachment 1: LSRO Application Template

**Attachment 1: LSRO Application Template**

TBD