

**OPERATOR STAFFING REQUIREMENTS UNDER 10 CFR § 50.54(m)
AS APPLICABLE TO A
PEBBLE BED MODULAR REACTOR (PBMR) FACILITY**

I. ISSUE:

10 CFR § 50.54(m) specifies minimum licensed operator staffing requirements. However, it does not identify staffing requirements for sites with more than two units with a common control room. Moreover, Section 50.54(m) contains requirements on the location of operators; i.e., it requires that one senior reactor operator (SRO) be in the control room of a unit during operation, that one reactor operator (RO) be at the controls for each unit during operation, and that a SRO be present during fuel handling. If NRC were to treat each PBMR module as a separate unit, the staffing requirements in Section 50.54(m) would be excessive and unnecessary. This paper discusses a process for specifying more reasonable operator staffing requirements.

II. EXELON'S PROPOSAL:

- 1) The first PBMR license application and the PBMR design certification application will propose and justify licensed operator staffing requirements for three or more PBMR modules at a site with a common control room. Because Section 50.54(m) currently does not contain any requirements for such configurations, approval of such staffing requirements will not require an exemption.
- 2) For operation involving the first two PBMR modules, the minimum staffing requirements in Section 50.54(m) are probably excessive. Additionally, the requirements in Section 50.54(m) on the location of SROs and ROs would be excessive if applied to a PBMR facility. Therefore, as part of its application, Exelon will request and justify an exemption from these requirements for the PBMR.

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3) To avoid duplicative reviews for subsequent PBMR applications, the application for design certification of the PBMR under Part 52 will also specify licensed operator staffing requirements and request an exemption from Section 50.54(m).

III. ANALYSIS:

10 CFR § 50.54(m) identifies minimum staffing requirements for SROs and ROs for various plant modes. These staffing requirements vary, depending upon the number of "units" at a site and whether the units have a common control room. In general, for each shift with all units operating, the number of required ROs is $2U$ and the number of required SROs is $U+1$, where U is the number of units (with a decrease of one RO and SRO if there is a common control room). However, Section 50.54(m) does not specify staffing requirements for more than two units at a site with a common control room.

In addition to these requirements, Section 50.54(m) also specifies the following staffing requirements:

- Each licensee shall have at its site a person holding a senior operator license for all fueled units at the site who is assigned responsibility for overall plant operation at all times there is fuel in any unit. If a single senior operator does not hold a senior operator license on all fueled units at the site, then the licensee must have at the site two or more senior operators, who in combination are licensed as senior operators on all fueled units.
- When a nuclear power unit is in an operational mode other than cold shutdown or refueling, as defined by the unit's technical specifications, each licensee shall have a person holding a senior operator license for the nuclear power unit in the control room at all times. In addition to this senior operator, for each fueled nuclear power unit, a licensed operator or senior operator shall be present at the controls at all times.
- 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.

In general, the formula used to develop the staffing levels in Section 50.54(m), and the requirements on the location of operators in Section 50.54(m), are excessive for PBMRs. These staffing requirements were developed when all operating nuclear power plants relied on active safety systems to mitigate accidents. Since the PBMR is a passive plant that does not require early operator intervention to mitigate accidents, staffing levels less than those indicated in Section 50.54(m) are appropriate for the PBMR.

As the Commission recognized when it promulgated Section 50.54(m) in the aftermath of the Three Mile Island incident, an exemption from the staffing requirements may be warranted to provide for "reduced staffing levels based on plant size, lack of complexity, or other unique factors." 48 Fed. Reg. 31611 (July 11, 1983). The first PBMR license application and design certification application will justify a reduced staffing level.

Section 50.54(m) currently does not contain any staffing requirements for more than two units at a site with a common control room. Therefore, no exemption will be needed to specify minimum staffing requirements for operation of three or more modules with a common control room. In contrast, Section 50.54(m) provides minimum staffing requirements applicable to two units with a common control room and contains requirements regarding the location of ROs and SROs. If a module is treated as a "unit," an exemption from these requirements will be needed to provide for lower staffing. Such an exemption will be requested as part of the application for the license for the first PBMR facility and the design certification rule for the PBMR.