



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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December 13, 2022

MEMORANDUM TO: Christopher G. Miller, Director
Division of Reactor Oversight
Office of Nuclear Reactor Regulation

FROM: Philip McKenna, Chief
Reactor Assessment Branch
Division of Reactor Oversight

A handwritten signature in blue ink, appearing to read "P. McKenna".

Signed by McKenna, Philip
on 12/13/22

SUBJECT: REVIEW OF METRIC ON CONTINUITY OF RESIDENT
INSPECTOR/SENIOR RESIDENT INSPECTOR SITE STAFFING

In a charter, dated August 11, 2022 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML22215A061), you directed the formation of a working group tasked with conducting a review of the Reactor Oversight Process (ROP) metric for continuity of Resident Inspector (RI)/Senior Resident Inspector (SRI) site staffing. The purpose of the review was to review the basis for the current metric and determine if any changes are recommended to revise the metric based on experience with the RI program, including insights from the Davis-Besse Lessons Learned Task Force report (ML022760172). Specifically, the working group was directed to:

- Determine if the RI/SRI Site Staffing metric reflects experience with the RI program including insights from the Davis-Besse lessons learned report.
- Provide a recommended definition of continuity in site staffing.
- Identify positive and negative efforts in meeting the current site staffing metric.
- Determine if the current metric should be revised, and if so, identify recommendations for revising the metric reflecting experience gained with the RI program including insights from the Davis-Besse lessons learned recommendations.
- Confirm or recommend another way to track the metric (the metric is currently tracked by SF-50s).

The staff has completed that review and documented their findings and recommendations in the Enclosure.

Enclosure:
Continuity of Resident Inspector/Senior Resident Inspector
Site Staffing Metric Review Report

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SUBJECT: REVIEW OF METRIC ON CONTINUITY OF RESIDENT INSPECTOR/SENIOR
RESIDENT INSPECTOR SITE STAFFING DATED: DECEMBER 23, 2022

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DATE	11/30/2022	12/13/2022

Continuity of Resident Inspector/Senior Residente Inspector Site Staffing Metric Review Report

BACKGROUND

Inspection Manual Chapter (IMC) 0307, Appendix A, "Reactor Oversight Process Self-Assessment Metrics and Data Trending," dated 06/01/2020, describes Metric I-5 as: "Continuity of RI/SRI Site Staffing." The definition of the metric is described as: "Permanent inspector staffing levels for both Senior Resident Inspectors (SRIs) and Resident Inspectors (RIs) are maintained to provide continuity of regulatory oversight at each reactor site," and the notes in the metric state: "Qualified inspectors assigned to the site permanently or on a rotation with a minimum duration of 6 weeks shall be counted (tracked via SF-50)" [to meet the metric requirements]. The basis for the metric is listed as IMC 2515, "Light Water Reactor Inspection Program Operations Phase," dated March 8, 2021, and the Davis-Besse Lessons Learned Report (Agencywide Documents Access and Management System (ADAMS) Accession No. ML022760172). The Davis-Besse Lessons Learned (DBLL) Report, section 3.3.5(3) recommended that, "the NRC should establish measurements for resident inspector staffing, including the establishment of program expectations to satisfy minimum staffing levels."

To address this recommendation, the staff created a new metric incorporated into IMC 0307 "Reactor Oversight Process Self-Assessment Program," dated February 20, 2006, originally titled Analysis of Site Staffing, defined as "Semiannually, collect and analyze data in order to measure the permanent inspector staffing levels at each of the reactor sites for both RIs and SRIs in order to evaluate the agency's ability to provide continuity of regulatory oversight." In 2008, the metric was revised to include inspectors assigned to a site through a rotation with a minimum duration of six weeks. There was no documented basis for the change. The metric goal of 90 percent was established in a November 28, 2006 revision, again with no documented basis. Expectations for satisfying minimum staffing levels are documented in IMC 2515, "Light-Water Reactor Inspection Program – Operations Phase," dated March 8, 2021 (ML21062A084).

DISCUSSION

The NRC staff established a working group consisting of staff from NRR, and all four regions to conduct the review under a charter that can be found at ML22215A061. The working group was directed to:

1. Determine if the RI/SRI Site Staffing metric reflects experience with the RI program including insights from the DBLL report.
2. Provide a recommended definition of continuity in site staffing.
3. Identify positive and negative efforts in meeting the current site staffing metric.
4. Determine if the current metric should be revised, and if so, identify recommendations for revising the metric reflecting experience gained with the RI program including insights from the Davis-Besse lessons learned recommendations.
5. Confirm or recommend another way to track the metric (the metric is currently tracked by SF-50s).

Item 1

The working group concluded that the metric addresses the recommendation to establish measurements for resident inspector staffing and there is value in maintaining the metric to ensure adequate resident inspector staffing for every site.

The working group reviewed the DBLL report to understand the basis for the recommendation and considered the 20 years of experience with the RI program since the Davis-Besse reactor vessel head event. With respect to metrics, the question is, what are we trying to measure, and why are we measuring it? In this case, the metric addresses the recommendation to establish measurements for resident inspector staffing. While there have been some challenges meeting the metric recently, the working group concluded that the metric ensures adequate resident inspector staffing for every site. When the staff transitioned to remote inspection during the pandemic of CY 2020-2021, the experience re-emphasized the importance of inspectors being onsite to provide coverage. There is no better way to identify something that may not be right at an operating reactor site. The metric also highlights the challenges some regions are experiencing in staffing the RI/SRI positions at some sites. The metric is a program metric accounting for all reactor sites. While the overall program metric has always been green, since 2015, the number of individual sites not meeting the metric has been increasing to a total of nine sites in each of calendar years (CY) 2020 and 2021. There are several reasons for this, including the drawdown resulting from the nuclear renaissance not materializing, to the inspection effort associated with the construction of Vogtle Units 3 and 4. Ultimately, this reflects the health of the overall RI program staffing levels. NRC management recognizes the importance of recruiting and retaining resident inspectors and have implemented several new initiatives to address the concern. The working group concluded that with healthy RI program staffing levels, this metric should not be challenging to meet.

NRC oversight of operating reactor facilities has changed significantly since the Davis-Besse event occurred. In 2001, the ROP was in its infancy, and the reactor vessel head degradation occurred before the full baseline inspection program was implemented. Daily or weekly plant status meetings within the regions ensure there are more inspectors hearing about the issues at each site than just those assigned to a site and asking questions to minimize the risk that something safety significant will be missed. There are new tools such as the NRC Issue Tracking Application (NITA) available to all inspectors to track issues. Some practices still exist. Regions continue to send temporary inspectors to a site who are not fully qualified. The rationale is that it is better to have a basic level qualified inspector onsite than to have nobody filling the resident inspector position.

The working group considered the requirement for a minimum six-week rotation for an acting inspector to count towards meeting the metric. The group concluded that there was no technical basis for the six-week minimum. Long ago six weeks was considered an inspection period, so it is likely that credit was only considered for an inspector onsite for a full inspection period. Another possible source for the six-week minimum is that was typically the length of time for issuing an SF-50 for staff going on rotation. Neither of these conditions exist today. The group considered whether the six-week minimum was an important criterion; the longer an inspector spends at a site, the more familiar they become with the plant, licensee staff, and licensee processes, ostensibly making them a more effective inspector. Inspector effectiveness is very difficult to measure and is highly dependent on experience and knowledge of the facility. The question was, who would be expected to be more effective, an inspector on rotation for six weeks who is qualified as a Basic Inspector under IMC 1245, Appendix A, or the Senior Project Engineer onsite for a two-week period? The consensus was that having the more experienced

inspector onsite for a shorter period was preferable. The consequence of shorter backfill assignments is more turnover which could lead to a potentially safety-significant issue not being communicated to the permanently assigned inspector without a thorough debrief. There is a potential benefit to the assignment of temporary inspectors in that there are more eyes and different sets of eyes inspecting the site, asking questions that ultimately may lead to the identification of a safety-significant issue when the right questions are asked. This metric is not attempting to measure effectiveness of inspection oversight since effectiveness is dependent on individuals and nearly impossible to measure. The metric is measuring site staffing of inspectors performing the duties of the RI/SRI.

Item 2

The working group concluded that the term “continuity” of regulatory oversight does not appropriately describe this metric.

The working group attempted to define “continuity” in site staffing as it pertains to this metric. It can be defined several ways; it could simply mean a continuous presence. The working group defined it as continuous presence of the resident and senior resident inspectors, without change or interruption. The term implies stability. The permanently assigned RI and SRI normally act as a team, and they develop a synergy that results in highly effective and efficient oversight. The introduction of acting RIs interrupts that synergy. Efficiency is lost when the remaining permanent RI/SRI takes time away from inspection to provide familiarization tours for acting inspectors, train them on licensee programs and processes, and in many cases, train inspectors who are not fully qualified. When multiple acting inspectors are assigned to a site for six-week (or greater) periods of time, continuity is lost. Issues tracked by one acting inspector may not be clearly communicated to or acted upon by the next acting inspector to close out. The DBLL report does not mention the term “continuity.” The facts described in that report describe a situation where only one inspector was permanently assigned to the site for a period of a year with temporary inspectors backfilling based on availability. There was also an extended gap in the SPE position, as well as minimal supervisory oversight during the period in which the Davis-Besse vessel head was degrading.

Item 3

Metrics are not intended to drive behavior. Their purpose is to ensure program objectives are being met and ensure reliable and uniform program implementation. While the program office consistently states that it is acceptable to miss a metric when there is a good reason, it is not in the nature of NRC staff or management to miss a metric if it is within their ability to control. This trait results in supervisors spending excessive time on site staffing issues to meet the metric.

The site staffing metric is an important indicator, but it is a lagging indicator and does not consider sufficient aspects to provide an accurate assessment of the health of resident site staffing. It informs the NRC if we have maintained two permanently assigned inspectors that are at least IMC 1245 Appendix A, Basic Qualified for a large portion of the year, and this is a misnomer since acting RIs are not “permanently” assigned. The metric does not look at the synergy of the resident office staff, which includes the staff experience, technical disciplines, and compatibility. Even though the regions are not always successful recruiting inspectors for a minimum six-week rotation to meet the metric, the regions strive to fill vacancies with shorter term backfills to ensure adequate staffing at the resident offices.

During the last 18 months, COVID-19 and staff attrition (promotions, resignations, and support to Vogtle 3&4) out of the Region II Operating Reactor Business Line resulted in many vacancies in the RI population. For example, in mid-Fiscal Year 2022, the Region II reactor business line was operating with 72% of staff. This resulted in five resident offices having vacancies greater than twelve weeks and three for nearly a full year. To address these issues the region continued to fill these positions with rotating staff from typically one week to approximately three months. This worked well when experienced inspectors, who were familiar with the site, provided site coverage, but was less effective when less experienced inspectors provided site coverage, due to the lack of familiarization with the site or the ROP program. This also increased burden on the resident staff because the permanent resident staff had to manage and direct multiple supporting inspectors in managing the ROP.

The additional tactical management of continuously trying to staff the RI/SRI vacancies resulted in a significant increase in human capital management that reduced the leadership team's focus in other areas. Because the business line staffs had been reduced so significantly, Region II developed internal metrics to ensure the leadership team remained focused on resident site staffing and providing support to the resident sites. The management focus resulted in outreach to the Region II staff, using the Inspector Opportunity Portal, discussions with other regions, and posting and solicitation to fill the depleted resident staff. However, it became very difficult to obtain staff, in part due to the increased DRS inspections in the second and third year of the ROP cycle. Additionally, this was mostly a voluntary effort due to COVID-19, reduced office staffing in Region II, and limitations on travel expectations based on position descriptions. Due to a large influx of new staff, Region II has now transitioned management focus to knowledge transfer to prepare the new staff for their qualification boards and assignments.

The bottom line is that supervisors spend a lot of time focused on filling RI/SRI vacancies that should be better spent on safety-significant issues at their sites.

Item 4

The working group considered several options.

Option 1: Status quo – make no changes to the current metric

Pros:

- The metric has always been green so there is no compelling reason to change it.
- Regional tracking mechanisms already in place and the data gathering is well understood so there would be no impact on resources.
- The current metric brings management attention to those reactor sites where it is difficult to get volunteers to backfill RI positions.

Cons:

- The title of the metric is inconsistent with what the metric is really measuring.
- It is more challenging recruiting qualified inspectors to go on a six-week or longer rotation than it would be for shorter periods of time.

Option 2: Eliminate the metric

Pros:

- One less item for regions to track and report.

Cons:

- The metric brings management attention to those sites not meeting the expectation for minimum site coverage. Elimination would require an alternate means to identify site staffing concerns.

Option 3: Revise the metric to:

- Rename the metric to reflect what it is measuring, e.g., RI/SRI Site Staffing. Until recently the metric was titled “Analysis of RI/SRI Site Staffing.”
- Eliminate the six-week minimum rotation length to count towards meeting the metric; reduce it to the minimum for which an SF-50 would be issued, e.g., two weeks.
- Maintain the existing criterion for permanently assigned RIs to be absent a minimum of six weeks before counting against the metric.
- Address the situation where an inspector may not be able to be physically at the site but can inspect remotely, consistent with the pandemic response.

Pros:

- Increased flexibility for regions to staff RI/SRI positions temporarily without challenging the metric.
- Easier to recruit acting inspectors to cover a site for shorter periods of time.
- This change is still consistent with the purpose of the metric to measure site staffing.

Cons:

- Potentially greater turnover of temporary residents. More turnover could delay the review and/or Regional response to a potentially safety-significant issue.
- Shorter periods onsite will result in less familiarity with the site, potentially reducing the effectiveness of the inspector.

Option 4: Revise the metric to count only permanently assigned RI/SRI presence.

Pros:

- More appropriately measures the “continuity” of regulatory oversight, as defined by this working group.

Cons:

- Requires a new goal. It is not uncommon for an RI/SRI to be promoted to a new position, leave the inspector ranks, or transfer to a different job, requiring a lengthy period to post the vacancy and select a replacement, counting against the metric.
- Development of new Resident Inspector dashboard should make it easier for Branch Chiefs to monitor and track permanent inspector staffing and improve succession planning, eliminating the need for a new metric.

Option 5: Keep existing metric; create new metric to track permanent RI/SRI site coverage.

Pros:

- Ensures adequate site inspector coverage is tracked, as well as continuity of regulatory oversight.

Cons:

- Same as Option 4, plus increased burden on regions to track a new metric.

Recommendation: The working group recommends Option 3. The suggested title change for the metric more accurately describes what the metric is measuring. The elimination of the six-week minimum onsite requirement to count towards meeting the metric will provide more flexibility for regions to backfill for permanent RI/SRI positions without missing the metric. If “continuity of regulatory oversight” is synonymous with continuous inspector coverage, then that title would be appropriate. However, the phrase implies stability which is not consistent with the introduction of different temporary inspectors providing site coverage. Lessons learned from the pandemic, as well as tools available for inspectors to monitor the plant remotely suggest that inspectors assigned to a site inspecting remotely should be considered towards meeting the metric for site coverage.

The working group considered the Be RiskSMART framework regarding the recommendation to eliminate the minimum 6-week requirement for this metric.

SPOT		Likelihood
What can go right?	Easier to meet the metric. Potentially more volunteers to travel for shorter periods of time. More “eyes” on the plant increase likelihood of identifying something that doesn’t look right.	High Medium (depends on individuals)
What can go wrong?	Missing a safety significant issue. Less time at site equals less familiarity with what looks right or wrong. Lack of continuity of inspectors tracking an issue if identified may result in issue not being recognized as risk-significant. Permanent RI/SRI has less time devoted to inspection while providing plant tours and training visiting inspectors on licensee procedures and processes. Plant tours can also provide permanent inspector to visit parts of plant not visited recently; increased opportunity to see something wrong. Potential delay for Regional review and/or response to a safety-significant issue.	Depends on inspector experience; questioning attitude. Proper turnover of identified issues is vital.
Manage		

	<p>Negotiate longer duration rotation if possible. More familiarity with site makes inspector potentially more effective.</p> <p>Use RI dashboard to select best fit inspectors to fill gaps in coverage (familiarity with the site and technology, experience) – if multiple volunteers</p> <p>Proper and thorough turnover of issues identified should limit potential for missing safety-significant issues.</p>	<p>Depends</p> <p>More likely if rotations are shorter</p> <p>Likely if a permanently assigned inspector is onsite for turnover</p>
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Item 5

The working group confirmed the best way to track this metric is the issuance of an SF-50. It is common practice now to issue an SF-50 for rotations that are shorter than six weeks. The group discussed examples of when an SF-50 is not issued for a rotation, e.g., the SF-50 would result in a decrease in pay for the volunteering inspector. For these special cases, the regions should manually track site coverage for the purposes of reporting this metric for the annual ROP self-assessment.

Conclusion

In summary, the working group concluded that the metric is important, and should be retained with some revision. The basis for the minimum six-week rotation to count towards the metric no longer exists, so the working group recommendation is to eliminate it, or reduce it to a full pay period, or two weeks. An inspector onsite for less time is typically in a caretaker role and not performing all the duties of an RI/SRI. Acting inspectors generally interrupt the permanently assigned inspector’s routine and detracts from their inspection focus, and the turnover involved with several acting inspectors interrupts the continuity that is the basis for this metric. Until recently, this metric was described as Analysis of Site Staffing, which is a better description of what is being measured, and therefore the recommendation is to revise the description.