

May 11, 2026

**Subject: BTI Comment on Modernizing Requirements Relating to Physical Protection of Category 1 and Category 2 Quantities of Radioactive Material [Docket ID NRC-2025-1238].**

The Breakthrough Institute (BTI) appreciates the opportunity to comment on the Nuclear Regulatory Commission's proposed rule, *Modernizing Requirements Relating to Physical Protection of Category 1 and Category 2 Quantities of Radioactive Material* (Docket ID NRC-2025-1238).<sup>1</sup> BTI is an independent 501(c)(3) global research center that advocates for appropriate regulation and oversight of nuclear reactors and radioactive materials to enable the new and continued use of safe and clean nuclear energy. BTI acts in the public interest and does not receive funding from industry.

The proposed rule revises 10 CFR Part 37 to remove or modify several physical protection requirements for Category 1 and Category 2 quantities of radioactive material, consistent with the direction of Executive Order 14300.<sup>2</sup> Many of the proposed changes reflect sound, risk-informed judgment and should be finalized as drafted. Removing the ten-year reinvestigation requirement, discontinuing the prescriptive maintenance and testing program, and reducing requirements that have not materially improved security assurance are defensible adjustments where the underlying performance objectives are otherwise preserved.

BTI's principal concern is that the proposed rule treats response coordination as a periodic licensee-local law enforcement agency (LLEA) requirement rather than as part of a holistic, risk-informed incident response architecture. Sections 37.43(c) and 37.45 were designed around a bilateral model in which radiation expertise resides at the licensee, armed-response capability sits at the local law enforcement agency, and the two are linked through information transfer at the moment of need. That model does not fully reflect how a Category 1 or Category 2 materials-security incident would likely unfold. The proposed rule reduces the frequency of the existing coordination requirement but does not address whether the structure of that requirement is adequate.

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<sup>1</sup> *Modernizing Requirements Relating to Physical Protection of Category 1 and Category 2 Quantities of Radioactive Material*, 91 Fed. Reg. 17,893, proposed Apr. 9, 2026, <https://www.federalregister.gov/d/2026-06877>.

<sup>2</sup> Executive Order 14300, Ordering the Reform of the Nuclear Regulatory Commission, May 29, 2025.

BTI submits these comments to support the burden-reducing intent of the proposed rule while preserving the security architecture Part 37 is meant to deliver. BTI offers four principal recommendations:

1. Retain the existing annual frequency, and recognize federally curated training as a compliant pathway to reduce regulatory burden. Address the multi-agency response architecture issues in §§ 37.43 and 37.45 through the final rule preamble and the planned NUREG-2155 revision;
2. Retain the backup communications requirement at § 37.49(c)(2) under a simplified § 37.49(c);
3. Pair removal of the § 37.25(c) ten-year reinvestigation requirement with periodic random sampling in the inspection program;
4. Clarify in the final rule preamble what counts as acceptable operability evidence following removal of the § 37.49(a)(3)(ii) weekly verification and § 37.51 maintenance-and-testing requirements.

These recommendations also inform BTI's responses to the NRC's specific requests for comment, which are addressed in Section V. BTI separately recommends that the NRC coordinate this rulemaking with related EO 14300 actions to avoid inconsistent implementation assumptions across concurrently modernized requirements.

Several of BTI's recommendations concern implementation issues that the NRC may address through the final rule preamble, interim FAQs, or the forthcoming revision to NUREG-2155 rather than through regulatory text. The proposed rule removes prescriptive requirements on the premise that remaining performance-based obligations will continue to provide adequate security assurance. The final rule record should identify the principal implementation issues that must be addressed with interim and final guidance. Where BTI recommends guidance clarification, the NRC should preserve the relevant performance expectation in the final rule record and commit to addressing implementation details through the guidance process that the NRC has already described.

## I. §§ 37.43 AND 37.45: RISK-INFORMED, MULTI-AGENCY RESPONSE ARCHITECTURE

BTI does not support a uniform triennial cadence as a substitute for the existing annual refresher training and LLEA coordination requirements. The proposed rule considers only the frequency of refresher training under § 37.43(c)(3) and LLEA coordination under § 37.45(d). That framing is incomplete. The more important question is whether Part 37 requires licensees to maintain the kind of role-appropriate, site-specific responder familiarity that would support an effective response during an actual security event. The recommendations in this section are calibrated to be addressable through the final rule preamble and the planned NUREG-2155 update.

The underlying structure rests on three assumptions that should be revisited. First, it assumes that radiological and facility-specific information can be transferred from the licensee to responders during or shortly before an incident. For many Category 2 licensees, relevant expertise may be concentrated in a radiation safety officer or a small number of technical personnel whose primary duties are clinical, research, or operational rather than security-response functions. Front-line clinical or laboratory staff at hospitals, blood banks, and academic facilities are not security professionals and are not in a position to operationalize threat-specific information at the moment of an incident. Second, the current framework assumes that local law enforcement personnel can make operational use of technical radiological information when called to respond. In practice, response is better served by pre-incident, role-appropriate familiarization rather than real-time translation by a limited number of licensee technical staff: how to recognize the source or device, whom to call, what standoff or back-away guidance applies, whether dosimetry or other protective equipment is available, how alarms are transmitted, and how the licensee will communicate with responders. Third, the framework assumes that the relevant responder population is two-part: the licensee and the LLEA. In practice, fire, EMS, hazmat, and federal response (FBI WMD Coordinator, NNSA Joint Technical Operations Team) are routinely involved, and several state jurisdictions require non-LLEA first responders to be the initial point of contact for radiological events.<sup>3</sup>

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<sup>3</sup> U.S. Nuclear Regulatory Commission, *Implementation Guidance for 10 CFR Part 37, "Physical Protection of Category 1 and Category 2 Quantities of Radioactive Material,"* NUREG-2155, Rev. 2, March 2022, § 37.45(b), Q5/A5 (acknowledging that some State or local jurisdictions require non-LLEA personnel, such as hazmat responders, as initial responders to radiological emergencies).

Those limitations point to a regulatory-design issue rather than a legal barrier. The NRC cannot compel a local police department, fire department, hospital, state agency, or federal partner to participate in a licensee's security planning. But the NRC can structure licensee obligations so that licensees are prepared to operate within the multi-agency response environment on which an effective materials-security response may depend. The agency has used analogous mechanisms in the reactor context: NRC regulations require nuclear power plant licensees to identify offsite response organizations, establish arrangements for requesting and using assistance resources, and maintain communications with principal response organizations.<sup>4</sup> Materials licensees are different from reactor licensees, and Part 37 should not import reactor emergency-planning requirements wholesale. NRC regulations *can* require licensees to plan for and coordinate with off-site response organizations without directly regulating those organizations.

The existing NRC guidance already points in this direction. NUREG-2155, Rev. 2, defines LLEA coordination activities as including "meetings, telephone conferences, plant tours, training in radiation protection, tabletop exercises, and other communications," and explicitly endorses the practice of inviting LLEA participation in licensees' annual health and safety training, with referral to federal training resources (the National Domestic Preparedness Consortium, FBI Field Office WMD Coordinators, and the DHS National Network of Fusion Centers) for LLEA-side preparation.<sup>5</sup> NUREG-2166 recommends that licensees "schedule joint training exercises periodically with the response force and any other internal or external organization (e.g., facility management, corporate management, the local fire department, the nearest hospital, the Federal Bureau of Investigation, the NRC, and Agreement State regulators) that may play a part in

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<sup>4</sup> 10 CFR § 50.47(b)(1) requires that the responsibilities of "each principal response organization" be specifically assigned and integrated; § 50.47(b)(3) requires "arrangements for requesting and effectively using assistance resources" with offsite organizations; § 50.47(b)(6) requires "provisions exist for prompt communications among principal response organizations"; and Part 50 Appendix E requires emergency plans to "incorporate information about the emergency response roles of supporting organizations and offsite agencies." 10 C.F.R. § 50.47(b)(1), (b)(3), (b)(6); 10 C.F.R. Part 50, Appendix E.

<sup>5</sup> NUREG-2155, Rev. 2, *supra* note 2, § 37.45(a), Q1/A1 and Q15/A15. *Question 15* asks: "What other resources are available to assist with the LLEA coordination process?", *Answer 15* lists federal training resources including the National Domestic Preparedness Consortium, FBI Field Office WMD Coordinators, and the DHS National Network of Fusion Centers.

responding to a threat at the facility,” and points to NNSA-sponsored alarm-response training and no-fault site-specific tabletop exercises through the Office of Radiological Security.<sup>6</sup>

Both NUREG-2155 and NUREG-2166 are explicit that drills and exercises are the most effective form of security training for risk-significant materials. Habits and awareness can erode in a 36-month gap.<sup>7</sup> NRC should, therefore, recognize federally curated or federally recognized training as a compliant pathway for the portions of § 37.43(c) that involve general security awareness, response concepts, and radiological-response familiarization. Site-specific elements under § 37.43(c)(3)(i)—(iv) (*facility layout, source location, security zones, alarm response, contacts, local procedures, etc.*) should remain the licensee’s responsibility. This approach would reduce the duplicative curriculum development burden while preserving the licensee-specific information that federal courses cannot supply.

The proposed rule implies that the current regulation provides more burden than benefit. § 37.43(c) and § 37.45 still describe a single-channel licensee-LLEA structure and adjust only its frequency, and the guidance’s broader menu remains advisory.

BTI recommends that the NRC use the final rule preamble and the planned NUREG-2155 revision to address the architectural questions raised above. The NRC should preserve the existing § 37.43(c)(3) and § 37.45(d) cadences in the final rule while revising language to better reflect risk-informed regulatory reform. That framework should include three elements:

1. The annual refresher cadence under § 37.43(c)(3) should be preserved in the final rule. The preamble of the final rule should instead reflect that licensees may use federal training programs to satisfy the applicable competency content of § 37.43(c)(1) and (c)(3), consistent with the existing endorsement of federal training resources in NUREG-2155, Rev. 2.<sup>8</sup> The planned NUREG-2155 revision should expand on that endorsement by identifying the specific federal training programs that cover the relevant competencies for different

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<sup>6</sup> U.S. Nuclear Regulatory Commission, *Physical Security Best Practices for the Protection of Risk-Significant Radioactive Material*, NUREG-2166, May 2014, § 5.5.2, Joint Training Exercises; § I-7 through I-9 (NNSA Alarm Response Training and Tabletop Exercises).

<sup>7</sup> A 2025 meta-analysis found that approximately half of initial training gains are lost after 6.5 months of nonuse for accuracy-based cognitive skills (the category that includes security-recognition tasks). Corey E. Tatel and Phillip L. Ackerman, "Procedural Skill Retention and Decay: A Meta-Analytic Review," *Psychological Bulletin* 151, no. 6 (June 2025): 696–736, <https://doi.org/10.1037/bul0000481>

<sup>8</sup> NUREG-2155 § 37.45(a): Q15/A15

responder populations. The site-specific elements in § 37.43(c)(3)(i)—(iv) remain the licensee's responsibility, but federal training is an existing, no-cost compliance option for the substantive security-knowledge content, and the rule revision should not foreclose its continued use. Higher-intensity training, such as drills and tabletop exercises, can be addressed at a triennial cadence in the NUREG-2155 revision.<sup>9</sup>

2. Confirm in the final rule preamble, and reflect in the planned NUREG-2155 update, that the § 37.45(d) coordination requirement may be satisfied through a site-specific multi-agency coordination activity that includes participation by responder entities relevant to the licensee's circumstances, including fire, EMS, hazmat, state radiological-health officials, Agreement State regulators, FBI WMD coordinators, or other appropriate federal or state resources.
3. Treat licensee-type risk calibration as a high-priority element of the planned NUREG-2155 revision. A Category 1 facility, a complex multi-zone Category 2 site, or a licensee operating mobile devices across state lines may warrant more structured coordination, more frequent site-specific updates, or tabletop exercises. A community hospital with a self-shielded Category 2 irradiator and a stable response environment may warrant simpler consideration. The forthcoming NUREG-2155 revision should provide differentiated guidance reflecting these distinctions, building on the licensee-category structure already used in NUREG-2166's appendices.

## II. § 37.49(c) — COMMUNICATIONS STILL NEED BACKUP SYSTEMS

The final rule should retain the backup communications path requirement in § 37.49(c)(2), with removal of only § 37.49(c)(1) and simplified language in an updated § 37.49(c).

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<sup>9</sup> Federally developed training programs that already cover the relevant competencies for different responder populations include, for incident-command and national-response literacy, FEMA Emergency Management Institute IS-100, IS-200, IS-700, and IS-800; for active-shooter and workplace-security preparedness, the DHS Cybersecurity and Infrastructure Security Agency Active Shooter Preparedness program; for radiological and nuclear response, FEMA Center for Domestic Preparedness courses and the Counter-Terrorism Operations Support program at the Nevada National Security Site; and, more broadly, the course catalog of the National Domestic Preparedness Consortium. The point is not that the NRC should endorse particular vendors or courses, but that the substitution opportunity is real and structural, and that recognizing federal training as a compliant pathway is consistent with NUREG-2155, Rev. 2, § 37.45(a), Q15/A15.

The NRC justifies removal of § 37.49(c) on the ground that § 37.49(a)(1) is sufficient because it requires continuous monitoring and detection capability in the event of a loss of the primary power source. However, each layer has a fundamentally different security purpose. § 37.49(a)(1) addresses whether the detection function continues to operate when power is lost. § 37.49(c) addresses whether the signals from that detection function can reach personnel who can act on them, and requires an alternative communications path not subject to the same failure modes as the primary. For example, a sensor on battery backup satisfies § 37.49(a)(1) even if the link from the sensor to the central monitoring station has failed. The NRC's own draft FAQ confirms this operational reality, acknowledging that licensees in practice implement alternative communication methods because the performance-based requirements in § 37.49 cannot reliably be met without them.<sup>10</sup>

The proposed rule, as written, creates a discrete failure mode: detection capability may remain operable while the communications or data-transmission path needed to act on that detection is unavailable. For example, a fixed self-shielded Category 2 irradiator in a hospital blood bank may use door sensors, motion sensors, or video equipment that report to a central security office over building network infrastructure. If building power, network equipment, or the primary communications link fails, those sensors may still satisfy § 37.49(a)(1) by remaining capable of detecting unauthorized access, while the alarm or assessment information does not reach personnel responsible for response. Current § 37.49(c)(2) addresses that failure mode by requiring an alternative communications and data-transmission capability not subject to the same failure mode as the primary system. The proposed rule would remove that express requirement.

BTI recommends simplified § 37.49(c) language to retain the previous requirement in § 37.49(c)(2):

*(c) Personnel communications and data transmission. For personnel and automated or electronic systems supporting the licensee's monitoring, detection, and assessment systems, licensees must provide an alternative communication capability for personnel, and an alternative data transmission and processing capability, in the event of a loss of*

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<sup>10</sup> U.S. Nuclear Regulatory Commission, *Draft FAQs for the Proposed Rule: Modernizing Requirements Relating to Physical Protection of Category 1 and Category 2 Quantities of Radioactive Material*, ADAMS Accession No. ML25287A030, response to "Is a licensee required to have backup communication and data systems in case the primary systems fail?" (noting that "many licensees implement alternative communication methods, such as radios, cell phones, or landlines, and backup data transmission capabilities to ensure continuity of operations during outages or equipment failures").

*the primary means of communication or data transmission and processing. Alternative communications and data transmission systems may not be subject to the same failure modes as the primary systems.*

### **III. § 37.25(C) REMOVAL SHOULD BE PAIRED WITH RANDOM SAMPLING IN THE INSPECTION PROGRAM**

BTI supports the removal of § 37.25(c) but recommends that the NRC's inspection program for Part 37 access-authorization compliance incorporate periodic random sampling of access-authorization records during inspections. The inspector would verify that licensees are maintaining current records under § 37.23, that their § 37.23(e)(4) administrative-withdrawal authority and § 37.23(e)(5) termination obligation are being exercised when warranted, and that reviewing officials are continuing to discharge their trustworthiness-and-reliability designation responsibilities. This change is implementable through inspection procedure updates rather than rulemaking and does not impose new periodic resampling obligations on licensees.

The NRC should consider periodic random sampling of access-authorization files since it provides a continuous and administrable verification mechanism rather than a universal ten-year reinvestigation requirement. Random sampling is more efficient, spreads administrative load across years, avoids the institutional memory problem of tracking individuals across a decade, and adds a continuous deterrent signal that scheduled reinvestigations do not. Sampling should be calibrated so that it does not recreate, in practice, the burden of the deleted ten-year reinvestigation requirement. The inspection program should also cover reviewing officials, who would otherwise have no specified verification cycle. This avoids any need for HR staff changes or improper record-keeping from being a liability, reduces burden, and is as likely to find an issue as scheduled surveillance. NRC should develop the sampling approach through inspection guidance rather than rule text.

### **IV. ROUTINE OPERATION AND WEEKLY VERIFICATION**

BTI supports removing the § 37.49(a)(3)(ii) weekly verification requirement and the § 37.51 maintenance-and-testing program requirement, but the final rule should preserve the distinct

performance expectations those provisions served. Specifically, the preamble should clarify continuing licensee responsibility for confirming the presence of stored Category 2 sources, while guidance should identify acceptable forms of operability evidence.

The NRC's rationale for removing weekly verification is strongest for Category 2 sources that are routinely used, observed, or handled in normal operations. The NRC's Nuclear Material Events Database shows that Category 2 source losses over the past fifteen years have mostly been transportation incidents and field losses at temporary job sites, not by insider diversion or substitution during storage.<sup>11</sup> Routinely used Category 2 sources are subject to operational checks during use that make silent substitution or diversion less likely. The rationale is less complete for Category 2 sources that are stored, idle, or used only intermittently. The final rule preamble should clarify that removal of § 37.49(a)(3)(ii) does not eliminate the licensee's responsibility to maintain reasonable assurance that stored or idle Category 2 material remains present and protected. The appropriate cadence and method should reflect the source, device, storage configuration, use pattern, and site-specific security posture.

The same distinction applies to the removal of § 37.51. A separate maintenance-and-testing program may be unnecessary for equipment that is continuously exercised or whose failures are readily apparent during normal operations. But some security components are not continuously exercised. Backup batteries, tamper-indicating devices on infrequently accessed storage, and redundant sensors may fail silently unless licensees maintain some form of operability evidence. A performance-based rule can account for this without preserving the current prescriptive § 37.51 program.

The draft FAQ's qualifying language that recognizes licensees can identify malfunctions during normal operations "in some cases" is honest about this limit.<sup>12</sup> The final guidance should identify acceptable forms of operability evidence (functional checks, system status logs, alarm-response

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<sup>11</sup> U.S. Nuclear Regulatory Commission, *Nuclear Material Events Database Annual Reports, FY2010—FY2020*, available at <https://nmed.inl.gov>. The reports show that Category 2 source loss events during this period were overwhelmingly associated with transportation and field operations rather than with in-storage diversion, and that recovery rates for Category 2 sources exceeded 95 percent.

<sup>12</sup> Draft FAQs, *supra* note 10, response to "If a licensee is not required to implement a maintenance and testing program, how can it ensure that intrusion alarms, associated communication systems, and other physical components remain functional and ready to perform when needed?"

records, vendor-recommended testing records) that licensees can maintain without a separate § 37.51-style program.

Additionally, BTI does not object to the proposed amendment to § 37.53(b) recognizing modern transponder-key and electronic-key-fob technologies as acceptable methods of disabling a vehicle. Licensees operating older vehicles without effective immobilizer systems should continue to rely on supplementary disabling methods.

Overall, BTI supports the NRC's move away from prescriptive maintenance and weekly verification requirements. The final rule will be stronger if the NRC explains how licensees should demonstrate continuing operability and material-accountability assurance under a performance-based framework.

## V. IMPLEMENTATION WITH AGREEMENT STATES

The timeline and rule do not align with the large role of Agreement States in Part 37 implementation and transition. The proposed rule removes provisions previously designated as Compatibility Category B (§§ 37.25(c), 37.49(a)(3)(ii), 37.49(c)(1), 37.49(c)(2)) and reassigns § 37.45(d) from Category B to Category C, on the rationale that maintaining the existing categories would produce gaps and conflicts across the National Materials Program.

The 30-day effective date proposed for the final rule does not align with the timelines that Agreement States need to amend their own regulations through state administrative processes. Approximately 780 of the 960 affected licensees are licensed by Agreement States, making the burden-reducing intent of the final rule partially offset by an extended period of dual-regime uncertainty. The final rule preamble should address the transition expressly by extending the effective date, clarifying inspector expectations during the Agreement State amendment cycle, or some combination of the two. This concern responds directly to the cumulative-effects-of-regulation question on the proposed 30-day effective date.

## VI. RESPONSES TO NRC SPECIFIC QUESTIONS

*Question #1 (§ 37.23(b)(2) certification transmittal removal):* BTI does not identify significant unintended consequences from removing the certification-transmittal requirement in § 37.23(b)(2). Licensees would continue to designate reviewing officials under oath or affirmation, document the determination, and remain subject to NRC inspection. Inspection is a more appropriate verification mechanism than transmittal for a determination that licensees are already required to document.

*Question #2 (§ 37.25(c) ten-year reinvestigation removal):* See Section III. BTI supports removal but recommends pairing it with periodic random sampling in the inspection program rather than scheduled reinvestigation, with reviewing officials covered in the sampling pool.

*Question #3 (§ 37.45(d) LLEA coordination frequency):* See Section I. The NRC should restructure §§ 37.43 and 37.45 around role-appropriate, multi-agency response familiarization and recognize federally curated training as a compliant pathway under § 37.43(c). The annual refresher cadence under § 37.43(c)(3) should be preserved in the final rule with higher-intensity training, such as drills and tabletop exercises, addressed at a triennial cadence in the NUREG-2155 revision.

*Cost and benefit estimates:* The headline savings figure (\$111.7 million undiscounted over 10 years) is dominated by the savings from training cadence. The training-cost baseline of \$10.1 million annually is derived by inflation-adjusting a 2010-dollar figure from the 2011 regulatory analysis, and Section I's recommendations rest in part on the observation that the training landscape has changed substantially in the intervening 14 years. BTI believes the burden reduction the agency seeks is already available through implementation choices that do not require extending the training interval.<sup>13</sup>

## VII. E.O. 14300 AND CROSS-RULE COORDINATION

This proposed rule is one component of the NRC's broader implementation of E.O. 14300, and the agency has signaled additional rulemakings revising other portions of 10 CFR are forthcoming

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<sup>13</sup> U.S. Nuclear Regulatory Commission, *Draft Regulatory Analysis for Proposed Rule: Modernizing Requirements Relating to Physical Protection of Category 1 and Category 2 Quantities of Radioactive Material*, ADAMS Accession No. ML25287A035 (2026).

on similar timelines. BTI recognizes the value of moving quickly on the E.O. 14300 docket, but the NRC should ensure that the Part 37 rulemaking does not create avoidable inconsistency across the regulatory frameworks that govern the physical protection of risk-significant radioactive material. As a practical matter, comment periods for interrelated dockets may close sequentially, making it difficult for stakeholders to assess cross-rule interactions once an earlier docket has already closed.

## CONCLUSION

BTI supports finalization of the burden-reducing changes that reflect sound risk-informed judgment. The final rule will be stronger if it retains § 37.49(c)(2), pairs the reinvestigation removal with random inspection sampling, clarifies operability evidence expectations, and either restructures §§ 37.43 and 37.45 around the integrated, risk-informed architecture in Section I or commits, in the final rule preamble, to a follow-on rulemaking that does so on a defined timeline.

BTI appreciates the opportunity to submit these comments and would welcome further engagement with the staff on the issues raised in this letter.

Sincerely,

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