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Standardization of Military Police Response to Uncertain CBRN and Explosive Incidents in the Czech Military Environment: Experimen tal Research Design

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Abstract

Contemporary military operations increasingly face incidents in which the nature of the hazard is initially unclear, involving possible chemical, biological, radiological, nuclear, explosive, or combined threats. In the Czech military environment, the role allocation between the Military Police and other military actors in uncertain chemical, biological, radiological, nuclear, and explosives (CBRN-E) incidents is not fully standardized. As a result, the Military Police may be expected to involve in scene control, personnel protection, preservation of evidentiary value, and escalation decisions despite limited organic CBRN capabilities. This article proposes an experimental research design for evaluating Military Police response to uncertain CBRN-E incidents under controlled but operationally realistic conditions. The model integrates tactical, technical, legal, and forensic variables and introduces a structured evaluation framework focused on decision latency, exposure risk, evidentiary integrity, coordination effectiveness, and procedural compliance. The study supports future standardization of response procedures, training, and coordination between the Military Police and specialized military units.

KEY WORDS: *Military Police; uncertain CBRN-E incidents; experimental research design; forensic evidence protection; procedural standardization; intra-military interoperability*

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1. Introduction

Contemporary military operations are increasingly shaped by hybrid threats and by incidents in which the nature of the hazard is not immediately identifiable. In such situations, first responders may encounter indicators suggesting chemical, biological, radiological, nuclear, explosive, or combined hazards, while the available information remains incomplete, contradictory, or misleading. This early phase is critical because decisions on scene security, responder protection, escalation, and preservation of potential evidence must often be taken before the hazard is reliably classified [1, 2].

As Wilson et al. observe, the contemporary strategic environment has created a renewed need to reinvigorate CBRN- E, military forensic, and counterterrorism capabilities and to enhance their integration in support of decision-making. This argument is relevant to the present study, because uncertain incidents in the military domain involve overlapping operational, forensic, and safety considerations and therefore require an integrated response approach. [10].

In the Czech Republic, the Military Police is established by Act No. 300/2013 Coll. as a unified armed police corps within the Ministry of Defence and performs police protection tasks in relation to the Ministry of Defence, the Armed Forces of the Czech Republic, designated persons, protected objects, military materiel, and other protected assets [6]. This institutional position means that the Military Police may become one of the relevant actors in the initial management of incidents occurring in the military domain. At the same time, this role does not imply the existence of organic specialist CBRN capabilities within the Military Police structure. At the same time, the allocation of roles in uncertain CBRN-E incidents is not fully standardized, particularly outside situations involving a confirmed explosion without actual or suspected CBRN contamination caused by the explosion. This creates procedural uncertainty in the initial phase of the response, especially with regard to scene control, evidentiary protection, and escalation in coordination with specialized military units. [1, 2, 6].

Recent forensic literature confirms that this problem is not merely organizational but also procedural and evidentiary. Studies on CBRN-contaminated forensic processes emphasize the complexity of forensic work in contaminated environments, while research on decontamination effects shows that some procedures may significantly affect trace survival and subsequent deoxyribonucleic acid (DNA) profiling [11, 12]. In parallel, multidisciplinary forensic analysis of suspected improvised explosive devices (IEDs) demonstrates that the sequencing of actions, interdisciplinary coordination, and evidence-handling procedures directly influence investigative quality [15].

This broader problem is supported by specific recent findings. Labaška et al. show that the forensic management of CBRN-contaminated evidence is shaped by an intricate relationship between evidence recovery, decontamination strategies, and preservation of forensic integrity [11]. This is reinforced by the experimental findings of Radgen-Morvant et al., who demonstrated that decontamination methods do not affect biological traces uniformly: biological decontaminants and chlorine-based agents hindered DNA profiling more markedly than several other tested decontamination methods [12]. Zampa et al. showed that multidisciplinary examination of suspected IED-related evidence requires a carefully planned sequence of forensic actions, since the applied procedure may affect the ability to recover different types of traces. They also emphasised the need for consistent labelling of exhibits and traces in order to support the correct communication, handling, and subsequent forensic interpretation of the evidential material [15].

This article addresses that problem by proposing an experimental research design focused on the standardization of Military Police response to uncertain CBRN-E incidents in the Czech military environment. It does not seek to replicate specialized CBRN or explosive ordnance disposal (EOD) capabilities within the Military Police. Rather, its purpose is to provide a methodologically structured framework through which initial-response procedures can later be evaluated, compared, and standardized with regard to escalation decisions, responder protection, forensic preservation, and coordination with specialized military units, and subsequently refined on the basis of the findings so as to become operationally effective and practically applicable [1-5].

2. Operational and Forensic Context

In uncertain CBRN-E incidents, the role of the Military Police must be considered in relation to a specific operational and institutional context, although its place in the initial response is not yet fully standardized. This section therefore addresses the fact that the role of the Military Police in uncertain CBRN-E incidents is not yet clearly standardized within the Czech military environment, the need to balance force protection and forensic integrity, and the research gap that justifies the proposed study.

2.1 Capability asymmetry in the Czech military environment

In practice, the key difficulty arises in the earliest phase of incidents in which the possible presence of CBRN-E agents cannot yet be excluded. At that moment, it is not clearly defined which military actor should assume which tasks, in what sequence, and under what procedural conditions. This uncertainty concerns scene approach, movement at the scene, personnel protection, preservation of evidentiary value, and escalation to specialized military units. For the purposes of this article, the analysis is limited to the territory of the Czech Republic and to situations falling within the statutory competence of the Military Police under Act No. 300/2013 Coll. From a practical perspective, coordination may be more straightforward in the explosive branch, as the Military Police includes pyrotechnic capacity within its own structure, whereas specialist CBRN capability remains external to it and is available only within the Armed Forces of the Czech Republic. In such situations, the practical problem lies not only in the absence of organic specialist CBRN capability within the Military Police, but also in the lack of clearly standardized procedures governing the initial response and the sequence of involvement of the relevant military actors [1, 2, 6].

Such incidents are especially demanding because they do not present a stable or readily classifiable operational picture. Initial indicators may include suspicious substances, possible device components, dispersed residues, contamination symptoms, false hazard indicators, or contradictory witness and sensor information [1, 2, 5].

Wilson et al. further note that CBRN-E intersects both counterterrorism and military operations, and that forensic procedures in military settings can generate intelligence and prosecutorial value if they are performed to both scientific and legal standards [10]. In the context of the present study, this supports the view that the early response phase may already influence the later evidentiary and investigative value of the incident, since the collection and recording of traces, the handling of evidentiary material, the documentation of the incident scene, and the subsequent investigative process fall within the remit of the Military Police.

2.2 Incident ambiguity, force protection, and forensic integrity

Uncertainty affects not only tactical decision-making but also the relationship between force protection and forensic requirements. The hazardous character of explosive or artillery-related incidents may also extend beyond the immediate tactical and forensic scene, since such events can generate environmental contamination and require subsequent sampling, monitoring, and risk assessment of affected soil [38, 40]. In a hazardous or potentially hazardous environment, responder safety must remain a primary concern. However, protective and containment measures may alter scene conditions, limit access, affect trace survival, or complicate documentation and recovery. Recent studies have shown that decontamination measures can significantly influence downstream forensic examination, including DNA profiling from biological material [12]. Reviews of forensic handling of CBRN-contaminated evidence also stress the need to balance safety, contamination control, and forensic preservation within a single procedural framework [11].

From a forensic perspective, the problem is not limited to responder safety alone. Both CBRN contamination itself and the decontamination measures applied afterwards may affect the recovery, preservation, and subsequent examination of evidence. Labaška et al. review the broader forensic challenges associated with CBRN-contaminated evidence, including the effects of chemical agents, biological materials, and ionising radiation on fingermarks and DNA [11]. Radgen-Morvant et al., in turn, focus specifically on decontamination methods and show that some approaches applied to blood and saliva can substantially impair DNA profiling [12].

A procedural framework for handling hazardous evidence is provided by international guidance and forensic standards. IAEA guidance on radiological crime scene management addresses the actions needed to collect and preserve evidence at a radiological crime scene [3, 4]. For the present study, ISO 21043-2:2018 is particularly relevant because it specifies requirements for the recognition, recording, collection, transport, and storage of items of potential forensic value, including scene assessment and examination [9].

A comparable process-oriented perspective is also evident in the radiological and nuclear field. Varga et al. describe the response process as linking environmental control, radiation protection, crime scene management, evidence collection, field measurements, and specialised laboratory analysis. They further emphasise that the analytical plan must integrate law- enforcement and judicial requirements with scientific aspects, including the timing and sequencing of analytical tasks [14].

2.3 Research gap and article objective

Although doctrinal, legal, and forensic guidance exists for hazardous incidents, the available knowledge remains fragmented. North Atlantic Treaty Organization (NATO) doctrine addresses comprehensive CBRN defence, IAEA guidance addresses radiological crime scene management and nuclear forensics, and United Nations Office on Drugs and Crime (UNODC) provides forensic best-practice guidance for CBRN incidents [1, 3-5]. Recent research has further developed the understanding of CBRN-contaminated traces, the impact of decontamination across different categories of evidence, and multidisciplinary approaches to suspected explosive devices [10-13, 15]. However, these sources do not provide a validated experimental framework specifically tailored to the initial response of the Military Police in situations where threat classification remains ambiguous during the earliest operational phase.

A recent study shows that CBRN preparedness and response remain uneven and that closer coordination between military, law-enforcement, and CBRN capabilities remains necessary, including threats involving explosives and improvised explosive devices [10].

This gap is analytically important because the first-response phase is the stage at which unresolved roles, legal responsibility, situational ambiguity, and the need to preserve forensic value intersect. The objective of this article is therefore twofold: first, to justify the need for standardizing Military Police response to uncertain CBRN-E incidents in the Czech military environment; and second, to propose an experimental research design capable of evaluating such response in a structured, reproducible, and analytically meaningful way [1-6, 10-12, 15].

3. Methodology and Experimental Research Design

To address the identified research gap, this article proposes an experimental design for evaluating Military Police response in uncertain CBRN-E incidents. This section outlines the proposed methodological approach, including the scenario logic, the structure of the variables, and the conditions required for reproducibility, safety, and analytical usefulness.

3.1 Scenario logic and operational phases

The proposed experiment takes the form of a modular field-oriented scenario replicating an incident falling within the statutory competence of the Military Police, in which the initial signs may indicate a possible CBRN hazard, an explosive hazard, a combined event, or a false alarm. The key design principle is that the scenario must not allow immediate and unequivocal classification. Instead, it should reproduce the uncertainty typical of the initial phase of such incidents, when the first observations and reported information may be incomplete, technically misleading, or affected by stress, fragmented reporting, and competing priorities. The purpose of the experiment is therefore to examine how Military Police personnel respond in the initial phase of an incident under current conditions, when they are equipped only with basic personal protective equipment and do not possess dedicated means for detecting CBRN-E materials, and to determine the appropriate sequence in which Military Police and other specialized units should access the incident scene while preserving the forensic value of traces. If the presence of a CBRN-E material is confirmed, this should lead to the involvement of other specialized branches of the armed forces and, where civilian populations may be at risk, may also require the involvement of elements of the Integrated Rescue System. Such confirmation would also affect the subsequent forensic procedures, including evidence collection, packaging, recording, transport, and storage. [1, 2, 5].

Within this framework, the proposed experiment is organised into a predefined and repeatable sequence of operational phases: incident notification, deployment of the Military Police, initial reconnaissance and site security, preliminary hazard assessment, scene containment measures and escalation to additional forces and resources, coordination with other specialised branches of the armed forces, coordination of access to the incident scene, documentation of the scene, forensic collection of traces and other evidence, packaging of evidence, decontamination of packaging materials before transport, transport and subsequent storage of evidence, decontamination of equipment and personnel, post-incident analytical review, and, where applicable, destruction of evidence after the expiry of the retention period. This phase structure reflects the actual procedural dilemma of first response, in which scene security, responder safety, and evidentiary continuity must be managed concurrently rather than sequentially. It also allows the experiment to assess whether escalation to other specialised branches of the armed forces occurs at the appropriate moment and on the basis of adequately substantiated findings. The proposed structure of the experiment is summarized in Fig. 1.

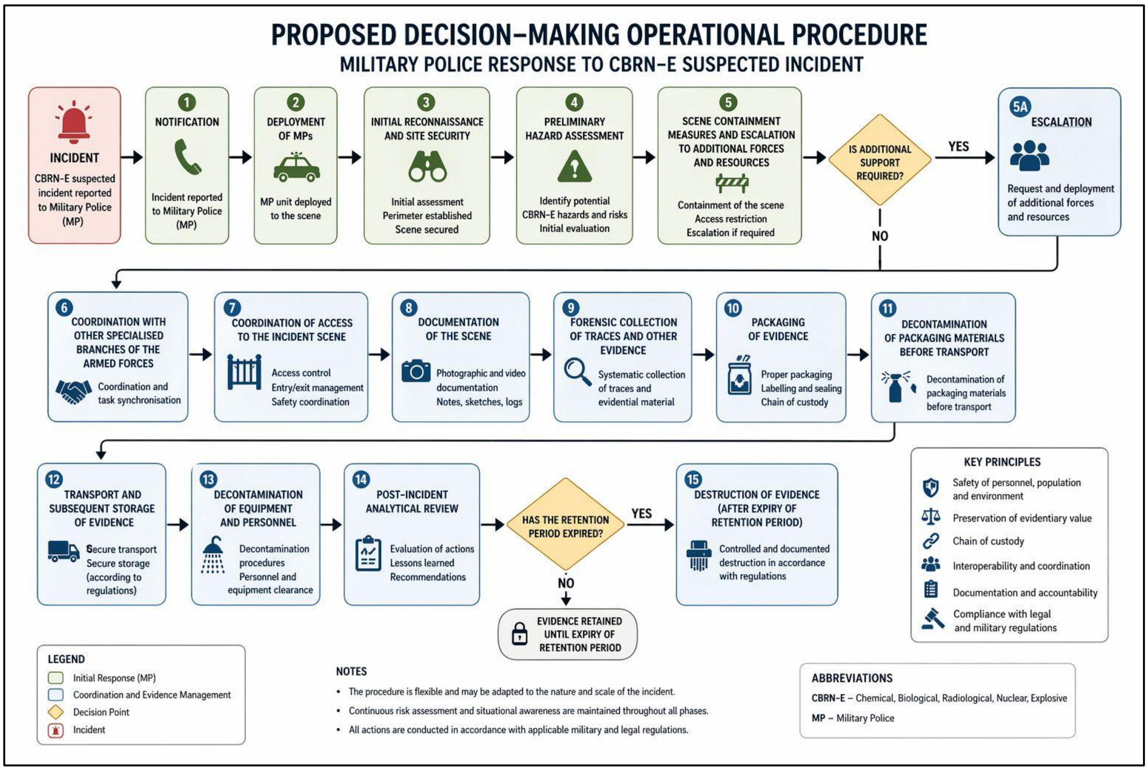

Fig. 1. Proposed operational decision flow for Military Police response to uncertain CBRN-E incidents.

This phase structure is also supported by recent work on CBRN-E incident-site investigation and on the integration of military, law-enforcement, and CBRN-E operations. Wilson et al. argue for a harmonized approach linking these functions [10]. Konieczny emphasises that effective on-scene investigation requires proper protection of the area, assessment of the size of the scene and the resources needed, efficient information exchange, and coordinated evidence-related activities under hazardous conditions [19].

3.2 Independent, dependent, and control variables

The experiment is conceived as a controlled multi-variable design. Independent variables are deliberately modified across iterations in order to observe their effect on response performance. These include the level of personal protective equipment available to responders, the availability of detection and analytical tools, the degree of information completeness at dispatch, logistic capacity, personnel strength, and communication burden. In the proposed design, these variables are intended to reflect the practical reality that uncertainty is shaped not only by the hazard itself, but also by equipment limitations, staffing constraints, communication flow, and information reliability.

Dependent variables represent the principal measured outputs of the design. These include time to escalation decision, escalation accuracy, exposure risk level, adequacy and efficiency of equipment use, evidentiary integrity, legal and procedural compliance, coordination effectiveness, and the functional performance of technical and organizational protocols. Importantly, the design does not reduce success to speed alone. A rapid response may be tactically attractive yet procedurally deficient if it unnecessarily increases exposure or compromises evidence preservation. Conversely, a slower response may remain appropriate if it reflects justified caution under ambiguous conditions.

The inclusion of evidentiary integrity among the dependent variables is therefore analytically necessary rather than optional. The experiment should therefore assess not only whether traces and evidential material were secured, but also whether they were secured in a manner compatible with their subsequent transfer, examination, and procedural use.

Table 1. Experimental variables and principal indicators

Category	Main elements	Analytical function
Independent variables	Level of personal protective equipment; availability of detection and analytical tools; information completeness at dispatch; logistic capacity; personnel strength; communication burden	To test how controlled changes affect response quality under operational ambiguity
Dependent variables	Time to escalation decision; escalation accuracy; exposure risk level; adequacy and efficiency of equipment use; evidentiary integrity; legal and procedural compliance; coordination effectiveness; functionality of technical and organizational protocols	To measure the effectiveness, safety, and forensic robustness of the response
Control variables	Terrain configuration; infrastructure layout; baseline scenario narrative; legal framework; predefined role distribution	To preserve comparability across scenario iterations and support reproducibility

Control variables remain constant across repetitions in order to preserve comparability. These include terrain configuration, infrastructure layout, baseline scenario narrative, legal framework, and predefined role distribution among participating responders. Their stability is essential for reproducibility, because it allows observed differences in performance to be interpreted primarily in relation to controlled modifications rather than environmental variation. In this sense, the design is intended not merely as a training exercise, but as an experimental platform capable of producing structured comparative observations relevant to future standardization. The structure of the proposed experimental design is summarized in Table 1.

3.3 Simulated environment, reproducibility, and safeguards

The experimental environment should replicate a realistic incident site while remaining medically, legally, and technically safe. It may therefore include simulated contamination zones, inert explosive devices or device components, forensic traces of different types, false hazard indicators, and controlled communication and logistic elements designed to create friction within the response process. The use of non-hazardous materials is essential because the purpose of the experiment is to reproduce the difficulty of decision-making under uncertain conditions, not to expose participants to real toxic, radiological, or explosive hazards.

Reproducibility is ensured through standardized scenario scripts, explicit variable definitions, fixed evaluation criteria, and uniform data-capture procedures. This approach is consistent with recent military research in which photosimulation, unmanned survey systems, emergency data preparation, mathematical modelling, and constructive simulation have been used to evaluate target acquisition, artillery support, obstacle-breaching concepts, survivability, and operational performance under degraded or otherwise demanding conditions [32–37]. These studies indicate that controlled experimental and simulation-based methods can provide a useful basis for verifying procedures, identifying capability limitations, and supporting the development of alternative or contingency approaches before their application in real operational environments [32–37]. Analytical material should include synchronized video review, communication logs, operational records, structured observation, and post-scenario debriefing. A further layer of evaluation may consist of a compliance audit examining the compatibility of responder actions with applicable legal, procedural, and forensic requirements. This combined approach is methodologically important because the response to uncertain CBRN or explosive incidents cannot be evaluated adequately through a single metric and requires simultaneous observation of tactical tempo, organizational coherence, procedural legality, and evidentiary preservation.

Ethical and safety safeguards form an integral part of the design. All participants should receive mandatory pre- briefing on scenario rules, safety constraints, and exercise objectives. Continuous instructor supervision is required throughout execution, and every part of the scenario must be configured to eliminate live-agent exposure and the use of functional explosive systems. Properly structured in this way, the proposed design offers a credible basis for identifying procedural vulnerabilities, comparing response patterns, and developing empirically grounded recommendations for the standardization of Military Police response in the Czech military environment.

4. Evaluation Framework

The proposed experimental design requires a structured evaluation framework capable of capturing not only whether the response was completed, but also the manner in which it was carried out under the given conditions. This section defines the main evaluation criteria, the sources of data used for their assessment, and the analytical outputs expected from the proposed design. Rather than relying on a single performance measure, the evaluation framework combines structured indicators with observation, documentation, and post-scenario reflection so that the exercise can be assessed in terms of coordination, safety, communication, procedural compliance, and preservation of evidentiary value. This approach is consistent with recent CBRN-E field training exercises and with validated tools for disaster-exercise design and evaluation [16,17].

4.1 Observed indicators and evaluation criteria

The first analytical dimension concerns decision-making performance under uncertainty. In this respect, decision latency should be treated as a core indicator, as it reflects the time required to move from initial notification or situational input to a concrete operational decision. However, decision latency cannot be interpreted in isolation. It must be assessed together with escalation accuracy, because a rapid escalation decision is not necessarily an appropriate one, just as a delayed decision is not automatically incorrect if it results from justified caution in the presence of ambiguous indicators. The evaluation framework should therefore distinguish between temporal efficiency and procedural appropriateness rather than treating speed as the sole proxy of effectiveness. This distinction is consistent with current forensic and hazardous-scene guidance, which emphasizes structured decision-making, secure scene control, and preservation of downstream investigative value [1, 3-5, 8, 9].

A second analytical dimension concerns responder safety and exposure control. In uncertain CBRN-E incidents, the response must be assessed with regard to whether personnel were exposed to avoidable risk, whether protective measures were proportionate to the available information, and whether the chosen level of intervention remained consistent with the responder's role and competence. Exposure risk should therefore be evaluated not only as a technical safety issue, but also as a procedural outcome influenced by scene assessment, communication quality, escalation timing, and discipline in the application of protective measures. In this context, the framework should identify whether risk arose primarily from insufficient caution, inappropriate confidence in preliminary information, inadequate recognition of the need for specialist support, or from the limited availability, inadequate allocation, and inappropriate use of personal protective equipment. [1, 2, 5].

A third dimension concerns forensic integrity. This includes preservation of the scene, protection of trace-bearing items, continuity and traceability of handling, adequacy of documentation, the manner of handling and packaging traces and evidential material, and the extent to which responder actions preserved the possibility of later specialist examination. Where decontamination procedures or decontamination mixtures are applied, the framework should also assess whether their use remained compatible with the preservation of evidentiary value. The evaluation should therefore examine not only whether traces and evidential material were secured, but also whether they were secured, handled, documented, packaged, and transferred in a manner compatible with their subsequent examination and procedural use, despite the need to protect responders and to operate under hazardous conditions at the scene [11,12,19].

Table 2. Evaluation dimensions, indicators, and main data sources

Evaluation dimension	Principal indicator(s)	Main data source(s)	Relevance for standardization
Decision-making performance	Decision latency; escalation accuracy	Video review; communication logs; observation sheets	Supports the definition of decision thresholds and escalation criteria
Responder safety and exposure control	Exposure risk level; proportionality of protective measures; availability, allocation, and appropriateness of use of personal protective equipment	Video review; observation sheets; debriefing	Supports standardization of protective logic, PPE allocation, and scene-entry discipline
Forensic integrity	Scene preservation; protection of trace-bearing items; continuity and traceability of handling; adequacy of documentation; handling and packaging of traces and evidential material; compatibility of decontamination procedures or decontamination mixtures with preservation of evidentiary value	Video review; observation sheets; operational records; documentation review; debriefing	Supports standardization of evidence preservation and evidence-handling procedures under uncertain CBRN-E conditions
Legal and procedural compliance	Compatibility with legal mandate; traceability of actions; adequacy of documentation and transfer procedures	Compliance audit; operational records; documentation review	Supports legally defensible and procedurally robust response procedures
Coordination effectiveness and protocol functionality	Communication coherence; clarity of responsibilities; functionality of escalation pathways; protocol usability	Communication logs; observation sheets; debriefing	Supports coordination between the Military Police and other specialised branches of the armed forces, as well as procedural harmonization

The evaluation framework should therefore assess not only the results of the response, but also the way in which the response was carried out. Relevant parameters include not only whether the required actions were completed, but also whether roles were understood, communication remained functional, documentation was maintained, safety measures were applied appropriately, and the response remained consistent with the requirements of the proposed design. In this way, the assessment moves beyond simple task completion and captures the quality of the response under the given conditions [16,17].

A fourth dimension concerns legal and procedural compliance. The response should be assessed against the relevant legal framework, internal procedural logic, and the broader forensic requirement that potentially evidentiary items be recognized, documented, handled, transported, and stored in a traceable and defensible manner. In practical terms, this means that the framework should identify whether responder actions remained compatible with the legal mandate of the Military Police, whether documentation and transfer procedures were properly maintained, and whether any action taken during the early response phase would later weaken evidentiary admissibility or interpretative reliability [3, 4, 6-9].

The final dimension concerns coordination effectiveness and protocol functionality. Uncertain CBRN-E incidents require interaction between policing, specialist, and command elements; so the design must evaluate whether communication pathways remained functional, whether responsibilities were understood, and whether escalation triggered a coherent transition from initial response to specialist engagement. This also includes evaluation of technical and organizational protocols, particularly whether they supported or obstructed decision-making under uncertain conditions. In this way, the framework moves beyond individual performance and captures systemic effectiveness, which is essential if the experiment is to contribute to future standardization rather than merely to individual training assessment. The principal analytical dimensions, indicators, and data sources are presented in Table 2.

4.2 Data sources and analytical outputs

The proposed framework requires a multi-source analytical approach. The principal data sources should include synchronized video recordings, communication logs, operational records, structured observation sheets, and post-scenario debriefing. Each source captures a different aspect of the response. Video records support reconstruction of timing, movement, scene-control decisions, and interaction with the environment. Communication logs provide insight into information flow, ambiguity management, escalation logic, and the relationship between situational interpretation and transmitted decisions. Operational records and observation sheets enable structured comparison between what was expected under the scenario design and what was actually performed by participating personnel. Debriefing then adds a reflective layer by clarifying how individual participants interpreted the incident, what assumptions guided their actions, and where procedural uncertainty was most strongly perceived. Such a multi-source design is consistent with recent CBRNe field training exercises using pre- and post-exercise questionnaires, observer guides, focus groups, structured participant briefings, and tactical objectives linked to defined performance indicators, as well as with validated exercise- design tools that emphasise coordination, communication, resources, safety, and documentation [16,17,20].

The evaluation should also include a compliance audit comparing observed actions with relevant legal, doctrinal, and forensic requirements. This audit is particularly important because the adequacy of response to uncertain CBRN-E incidents cannot be determined solely on tactical grounds. An action that appears operationally expedient may still be procedurally deficient if it undermines evidentiary continuity, exceeds the responder's competence, or fails to trigger specialist escalation at an appropriate threshold. The audit, therefore, provides the link between exercise performance and the later objective of procedural standardization [1, 3-9].

The principal analytical outputs of the framework should be threefold. First, the design should identify recurrent procedural vulnerabilities, such as delayed escalation, premature scene entry, insufficient access control, inconsistent documentation, or ineffective communication with specialist support. Second, it should reveal capability-sensitive performance patterns, that is, situations in which response quality degrades measurably as a function of reduced personnel strength, information incompleteness, communication burden, or limited technical support. Third, it should generate an evidence base for the later formulation of standardized decision thresholds and response criteria applicable to the Military Police in uncertain CBRN-E situations. The value of the experiment thus lies not only in observation, but in its capacity to transform observed performance into analytically grounded procedural recommendations. This analytical logic is consistent with research using modelling, simulation, and automated decision-support approaches to quantify operational risks, assess engagement conditions, and support command-and-control processes under complex or time-sensitive military conditions [39, 41].

5. Implications for Standardization of Military Police Response

The proposed experiment is intended to produce more than descriptive observations about responder behaviour. Its broader purpose is to support the future standardization of Military Police response to uncertain CBRN-E incidents by identifying the procedural areas in which ambiguity most severely affects safety, evidentiary continuity, and inter-agency coordination. This section, therefore, outlines the principal domains in which the findings of the experimental design may be translated into practical standardization measures.

5.1 Standardization priorities in uncertain CBRN-E incidents

The first implication concerns the need to standardize the logic of the initial response. In uncertain CBRN-E incidents, responders require a procedural framework that defines what must be done immediately, what must be avoided until further information is available, under what conditions the initial response must transition to specialist support, and in what sequence individual units should be deployed to the scene, including whether their deployment should be simultaneous, separated, or conditional on the evolving situation. Standardization should therefore focus on the earliest operational decisions, including scene approach, initial reconnaissance, access control, initial hazard recognition, containment, and escalation. The objective is not to replace professional judgment, but to ensure that the initial response follows a more consistent course in its most important steps [1, 2, 5].

A second priority concerns escalation criteria and decision thresholds. One of the central problems in uncertain incidents is that escalation is often delayed either because the initial findings do not yet allow a sufficiently reliable assessment of the hazard, or because responders attempt to maintain control in a situation that already exceeds their competence or technical support capacity. A standardized framework should therefore define threshold indicators that justify specialist involvement even in the absence of definitive classification. Such indicators may include suspicious combinations of physical traces, contamination markers, improvised components, conflicting information, unexplained symptoms, or procedural uncertainty that cannot be resolved through available first-response means. This would allow escalation to be based on predefined conditions rather than on a late response to a progressively deteriorating situation. [1, 3-5].

A third implication concerns the need to standardize the protection of potential evidence under hazardous conditions. Recent literature indicates that improper sequencing of actions at the scene, as well as unsuitable contamination-control measures, may affect the forensic value of traces [11,12,19]. For the Military Police, this means that standardization should include minimum requirements for scene documentation, access control, handling and packaging of traces and evidential material, and continuity of records, even before the scene has been definitively classified. The key principle should be that the initial response must not reduce the possibility of subsequent specialist and forensic examination.

5.2 Training and inter-agency implications

Training implications should focus primarily on clarifying the boundaries of responsibility and the tasks to be performed at the scene, on establishing the sequence of command and handover, and on defining which components would be involved in a real incident and at what stage of the response.

Similar experience from military education and simulation-based training indicates that complex response procedures are more effectively standardized when they are repeatedly tested in realistic but safe training environments, supported by shared curricula, simulation tools, war-gaming methods, and expert-based evaluation systems [21–26]. This supports the use of the proposed experimental design not only as a research framework, but also as a potential basis for future training, procedural verification, and inter-agency coordination exercises.

In this respect, training should not be limited to technical drill, but should serve to verify who is expected to do what, in what order, under what conditions, which specialised branches of the armed forces or other response elements should be activated, and at what point responsibility must pass to the next responder level. Standardization should therefore strengthen the interface between the Military Police and external specialist actors rather than attempt to blur their roles. In practical terms, this means that the future standard should define not only what the Military Police must do, but also what it must explicitly hand over, communicate, preserve, and document for the next responder level [10,17,19].

Comparable requirements for standardization, doctrinal adaptation, and the preservation of alternative procedures can also be observed in artillery-related research, where national procedures, NATO interoperability, GNSS-denied positioning, contingency calculation methods, and non-standard use of military capabilities are examined as means of maintaining operational effectiveness under degraded or atypical conditions [27–32].

5.3 Doctrinal significance and practical limits

At the doctrinal level, the proposed design supports a more explicit framework for the early phase of uncertain CBRN-E incidents. In the Czech military environment, the main difficulty does not arise only from the nature of the hazard itself, but also from the fact that the initial phase requires decisions on scene approach, access control, responder protection, preservation of evidentiary value, and the conditions under which CBRN specialists and pyrotechnicians should be involved, all before the situation has been reliably classified [1,3-5]. The proposed design is intended to structure this interval and to identify which elements of the initial response can be standardized, under what conditions, and with what limits.

This point is consistent with Wilson et al., who argue that current political, strategic, and operational conditions require stronger integration of military, law-enforcement, and CBRN operations in support of decision-making [10]. In the present context, that broader argument is applied to the specific conditions of Military Police response in the Czech military environment, especially to the question of how the initial response should be organised before CBRN specialists and pyrotechnicians assume their role.

At the same time, the scope of standardization must remain realistic. The proposed framework is not intended to transform the Military Police into a specialist CBRN or pyrotechnic component, nor to suggest that every uncertain situation can be resolved through predetermined procedures alone. Its value lies in defining what should be standardized, where professional discretion must remain, and at what point the involvement of CBRN specialists or pyrotechnicians should become necessary. In this sense, the proposed design is best understood as a basis for a more predictable, safer, and forensically more robust early response.

6. Conclusions

The article has argued that uncertain CBRN-E incidents represent a specific procedural and operational challenge for the Military Police in the Czech military environment. Their complexity does not lie only in the hazardous character of the scene, but above all in the fact that the initial response must be conducted before the threat is reliably classified. In this interval, the Military Police is required to reconcile scene security, responder protection, evidentiary continuity, and timely escalation despite the absence of organic specialist CBRN capabilities. For this reason, the problem cannot be addressed solely through general doctrinal guidance or ad hoc practical experience. It requires a structured basis for standardization.

To address this need, the article has proposed an experimental research design focused on the evaluation of Military Police response to uncertain CBRN-E incidents under controlled but operationally realistic conditions. The proposed model integrates tactical, technical, legal, and forensic dimensions of the response and provides a framework for examining decision latency, escalation accuracy, exposure risk, evidentiary integrity, coordination effectiveness, and procedural compliance. Its main contribution lies in offering a reproducible analytical platform through which procedural vulnerabilities, capability limitations, and inconsistencies in early response logic may be identified and compared.

The proposed framework is not intended to substitute for specialist CBRN or explosive-response capacities. Rather, its purpose is to define what should be standardized within the mandate of the Military Police, where procedural discretion must remain, and at what point specialist escalation becomes necessary. In this respect, the design supports the future development of standard operating procedures, training models, and inter-agency coordination mechanisms that are better adapted to incidents in which the nature of the hazard is initially unclear

At the same time, the limits of the approach must be acknowledged. A simulated experimental environment cannot fully reproduce the psychological stress, informational volatility, or operational unpredictability of real incidents. The proposed design should therefore be understood as a methodological foundation for subsequent validation in training and practice rather than as a final operational solution. Nevertheless, it provides a defensible starting point for improving predictability, reducing avoidable exposure risk, and strengthening the legal and forensic robustness of Military Police response in hazardous and initially uncertain environments.

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