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Executive Summary

The Institute for Defense Analyses (IDA) has assisted the Korean Institute for Defense Analyses (KIDA) in the identification of international best practices in defense strategy, planning, and resource management. As part of this effort, this document examines best practices for defense planning scenarios, and in particular, their usage in the United Kingdom (UK) and United States (U.S.). This document offers an in-depth analysis of KIDA's approach to scenarios using the identified international best practices with specific recommendations for improvement in the approach, scenario construction, and scenario management.

The purpose of scenarios is to provide senior decision-makers with a mechanism that can produce impartial, evidence-based advice on a range of critical issues. Scenarios are the basis for conducting studies and analysis to support these senior decision-makers. Paramount is the use of scenarios in evaluating risk – e.g., risk in force structure, readiness of forces, capabilities, and technology. In a resource-constrained environment, it is vital to have access to alternative costed options to help senior decision-makers understand the trade space to address these security challenges and balance risk and resources between them.

International best practice identifies a scenario as a fictitious, yet plausible sequence of events set in the real world, 3-to-20 years in the future. The plausibility of the scenario is essential to its credibility, with the sequence of events leading to military intervention based on intelligence. A scenario can portray any mission involving the use of armed forces, including but not limited to combat operations, counter-terrorism, and peace support.

Scenarios specify a projected force structure; context justifying the need for military action; the nature of the mission; assumptions about the geographic, temporal, military, diplomatic, and legal conditions under which the scenario occurs; and the desired end-state. Scenarios reflect joint planning and are not service-specific. Scenarios are nested: highly specific tactical scenarios feed into more abstract operational and strategic scenarios, and vice versa.

Scenarios provide an agreed set of common data enabling the study and analysis of different concepts, capabilities, courses of action, technologies, and force structures. Though scenarios can support analysis across all lines of force development – doctrine, organizations, training, material, leadership and education, personnel, and facilities (DOTMLPF) – they are particularly useful in bringing attention to often-overlooked areas such as combat service support and joint enablers.

Scenario development should be transparent and centrally managed for the end products to be widely accepted and used. A permanent office staffed by a mix of active military and civilians

typically owns and manages scenarios. This staff works to ensure that scenarios possess five key attributes. Scenarios must be:

- *Relevant*: based on projected force structure and likely military missions;
- *Reasonable*: plausible and feasible;
- *Robust*: free from bias towards a particular service or viewpoint;
- *Reusable*: applicable over a variety of studies; and
- *Responsive*: meet analytical and decision-making needs.

The UK and the U.S. make extensive use of defense planning scenarios. In the UK, scenarios are the responsibility of the Policy team within the Head Office of the Ministry of Defense (MoD). An MoD committee with representatives from all the military services and components meets twice a year to provide oversight and guidance on the portfolio of scenarios, their content, and use. Scenarios are tightly linked to national policy by Defense Strategic Guidance; although scenarios are formally reviewed every year, significant changes typically are made through a change of government or an exogenous shock (e.g., September 11th).

Within the U.S. Department of Defense (DOD), scenario development is characterized by centralized direction and decentralized execution. The Office of the Secretary of Defense (OSD) and Joint Chiefs of Staff provide top-level guidance for the direction and content of scenarios, while a variety of specialized offices across OSD, the Joint Staff, services, and component agencies actually create them. Scenario development is central to the Support for Strategic Analysis (SSA) process, which supports deliberations by DOD leadership on strategic, planning, and budgetary decisions. The process creates 12-15 analysis-ready scenarios, which are updated every two years. Scenarios are tied to national policy via Defense Planning Guidance.

The United States and the UK have successfully institutionalized the use of scenarios to provide senior leaders with objective, evidence-based advice to manage risk, examine options, and make resource allocations. A significant reason for this success is that these same senior leaders have championed the use of scenarios from the top of their organizations.

Within KIDA, scenario development and its role in underpinning analysis for senior leaders are in its early stages. Not being widely understood or supported would indicate that there is work to be done to educate key stakeholders and senior leaders of the Republic of Korea (RoK). This must be addressed as a priority to implement an effective process for analyzing the program of record against the most important missions. This has not prevented KIDA from making major strides in scenario construction and development. Down-selecting and prioritizing the scenarios helps to focus KIDA's limited scenario development resources, but the process appears to rely on KIDA's judgement of priorities and likelihood and not on input from senior leaders and intelligence.

Five key improvements will build on KIDA's progress and significantly strengthen the use of scenarios:

- The most important factor is to obtain senior leadership ownership of the scenarios and analytic processes as critical inputs to decision-making.
- A formal process, office, and responsibilities should be established for scenario development and management.
- Focus on a smaller number of high-quality scenarios with a clear linkage to senior leader priorities and defense policy/strategy.
- RoK scenario development process would benefit from adopting the five key attributes identified by international best practices.
- KIDA's current scenario construct would benefit from the addition of several elements from the international best practice.

Although it involves organizational and process challenges, the adoption of this scenario development approach can significantly strengthen the Korean analytical community's ability to support senior leader decision-making. The experience of the UK and US has demonstrated that the return on this investment is substantial. Well-written scenarios are a critical step in evaluating the Korean defense program and identifying cost-constrained alternatives to reduce risk and provide the capabilities need to satisfy the national security strategy.

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Contents

1. Introduction

In 2013 the Institute for Defense Analyses (IDA) completed research for the Korean Institute for Defense Analyses (KIDA), *Observations on the Republic of Korea Requirements Verification System*, which identified international best practices on capability planning, including the role of strategy, planning, and resource management. IDA researchers analyzed the approaches taken by Australia, the United Kingdom (UK), and the United States (U.S.).

The final report (IDA Document D-5044) identified findings and recommendations, including:

> "The use of defense planning scenarios (DPSs) in capability planning and KIDA analysis may be useful. DPSs describe notional but realistic future defense challenges. Developing a standard DPS library would help the MND[1] describe a future strategic environment and corresponding military challenges. Requiring the Services, Joint Staff and FRVS[2] analysts to use standard DPSs for all capability planning links planning to this strategic direction and increases joint perspective, even in Service planning." (p. 62).

KIDA commissioned follow-on research to provide more detailed guidance and insight on the use of scenarios in defense planning. This research was conducted in two phases:

- Analysis of the international best practices in the use of defense planning scenarios
- Analysis of the use of scenarios by the Republic of Korea (RoK) and recommendations for improvement

The first phase was completed and reported in April 2015 (IDA D-5434). The second phase was concluded and discussed with KIDA colleagues in Seoul in January 2016. This report documents the results of both phases.

This report has three parts: first is a description of international best practice; then a commentary of the U.S., UK, and RoK use of scenarios against international best practice; and finally, recommendations for RoK

The international best practice defines a scenario and identifies its key attributes. It also covers the vital aspect of the management of scenarios, ownership of the scenario development process, and pitfalls to avoid.

The analysis and commentary on the U.S., UK, and RoK use of scenarios starts with an analysis of their derivation, then assesses their approaches against the five key attributes, highlighting areas of divergence between each and the international best practice.

[1] Ministry of National Defense.

[2] Force Requirements Verification System.

The analysis on RoK use of scenarios is dependent on the information provided to IDA by KIDA. IDA has not conducted independent research on how RoK develops or uses scenarios.

The recommendations for RoK are based upon the international best practice and presented in three areas:

- Key attributes of a scenario;
- Essential and non-essential elements of a scenario; and
- Management of scenarios.

2. International Best Practice

A. What is a Scenario?

There are many definitions of a scenario. IDA research starts with the Merriam-Webster online definition: "An account or synopsis of a possible course of action or events."[3]

The term Defense Planning Scenario (DPS) has meaning specific to the U.S. Department of Defense (DOD). To reduce the potential for confusion, the term DPS is not used during this research. This document simply refers to scenarios.

Within the context of international best practice, a scenario is a fictitious, yet plausible sequence of events set in the real world, 3-to-20 years in the future. The plausibility of the scenario is essential to its credibility, with the sequence of events leading to military intervention based on intelligence. Looking less than three years forward is too little time for a major resource allocation or force structure change to take place and is too similar to contingency planning. Further than 20 years into the future means no action must be taken in the short term, so there is little for decision-makers to decide. In addition, 20 years is so far away that there can be little confidence that projections made today will be accurate.

A scenario may cover any type of mission that involves the use of the Armed Forces. This can range from peace support mission, non-combatant evacuation, and international terrorism, to major armed conflicts. In addition, scenarios may include when the Armed Forces are in support of other government departments or agencies, such as disaster relief or humanitarian support, both overseas and at home.

While every scenario is unique, and each nation must develop scenarios that fit their purpose, the IDA research team identified a number of common elements that a scenario should encompass. A more detailed description of these elements is presented later in this document.

B. Why Scenarios are needed

Scenarios provide senior decision-makers with a mechanism that can produce impartial, evidence-based advice on a range of critical issues. Scenarios are the basis for conducting studies and analysis to support a senior decision-maker. Paramount is the use of scenarios in evaluating risk – e.g., risks in force structure, readiness of forces, capabilities, and technology. In a resource-constrained environment, having access to alternative costed options is vital in helping senior decision-makers understand the trade space for addressing these security challenges and balancing risk and resources between them.

These scenarios provide an agreed set of common data that enables the study and analysis of different concepts, capabilities, courses of action, technologies, and force structures.

[3] www.merriam-webster.com/dictionary/scenario, accessed on 21st Jan 2015.

The introduction and use of scenarios reduces significantly the dependence on expensive development activities and exercises. They also are more repeatable and auditable than tabletop exercises which can be useful for exploring operational concepts. Scenarios have the added advantage of being able to examine risk and options enterprise-wide.

Scenarios provide the baseline from which previously incomparable concepts or capabilities may be assessed and compared for cost effectiveness. For example, scenario-based analysis could provide insights on how to increase fire support, be it from mortars, field artillery (cannon or rocket), attack helicopters, and/or close-air support. Correctly constructed scenario-based analysis provides objective, evidence-based advice on the most cost-effective balance across these potential capabilities – independent of service, capability, or other potential advocacy.

C. The Role of a Scenario

Scenarios provide a common framework for analysis to support decision-making consistent with current Government policy.

The connection to current policy is vital to ensure that the scenario is relevant to challenges that the current Government wants the Armed Forces to undertake in the future.

They are a tool for analysis which provides standards and commonality across the defense enterprise to enable proper bench-marking and/or comparisons on often disparate things. Properly conducted, evidenced-based analysis to support senior decision-makers must be based on an agreed set of common assumptions and models. Only then will it be possible for the baseline and viable alternatives to be analyzed and compared.

Scenarios underpin the analysis conducted to inform senior leader deliberations and studies on strategy, policy, and acquisition matters. They support force sufficiency and effectiveness studies that examine the current force's ability to execute the defense strategy and future force structure, program alternatives, and risk.

For scenarios to be of maximum utility to senior decision-makers, most nations develop a number of scenarios which cover all potential missions for the Armed Forces, all potential operational environments, and all current and planned capabilities.

A scenario should represent the joint environment and not advocate for a particular component, capability, or solution. It should provide the context to address the strategic, through the operational to the tactical levels of warfare. The use of a common set of pre-approved scenarios will help mitigate, but not eliminate, a proponent’s attempts to select scenarios that favor a preferred or predetermined result.

Scenarios also can put a spotlight on often overlooked areas, such as joint enablers, intelligence, and combat service support, which are necessary for the Armed Forces to undertake a mission, but are often missed or ignored. Scenarios enable analysis across all lines of

development – doctrine, organizations, training, material, leadership and education, personnel, and facilities (DOTMLPF) to identify joint-based solutions.

D. Nature of a Scenario

Scenarios must represent a plausible, logical, and realistic sequence of events which results in a military response. They should be written in a manner that will enable operational concepts at the joint level – joint warfare, joint operational concepts, and joint capability planning.

While they should cover all potential missions that the current Government may ask the Armed Forces to undertake, scenarios should be independent of each other and be able to stand on their own. However, scenarios should have a nested nature that links strategic scenarios to operational and tactical scenarios. This ensures commonality of context and assumptions, and it is more efficient, reducing development costs.

Lastly, international best practice focuses on producing quality scenarios rather than quantity. A few well-written scenarios are more likely to be useful to senior decision-makers than many poorly researched and written scenarios. It is crucial to have well-constructed and auditable studies and analyses. Although well-written scenarios are an important starting point, a successful study is still dependent on sound analysis.

E. Nested Nature of Scenarios

Scenarios should be nested across the spectrum of operations – from strategic, through operational to tactical levels. This enables the analysis, and thereby the advice, to senior decision-makers to be consistent across various levels, and enables previously incomparable capabilities to be compared and alternatives to be analyzed.

The nested nature is similar to a parent and child analogy, with strategic scenarios providing the context for several operational-level scenarios to be derived from it. The same holds true that many tactical-level scenarios may be developed from a single operational-level scenario.

It is very efficient to nest scenarios, as many of the elements of the scenario will be the same, for example, environmental conditions, timescales, and, importantly, the assumptions.

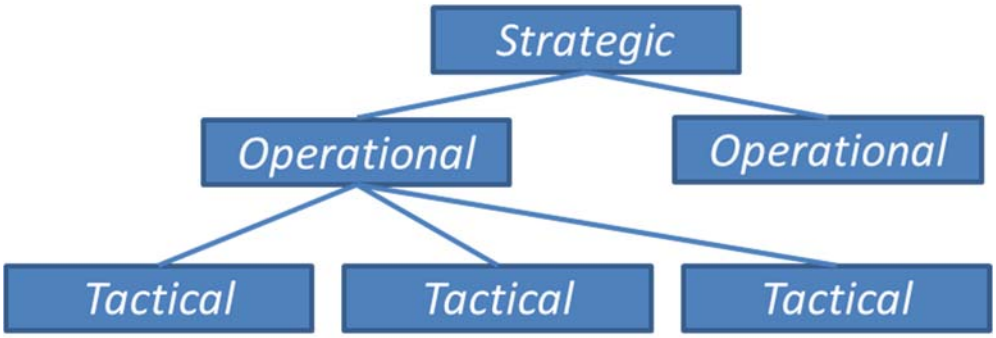

Figure 1. The Nested Nature of Scenarios

F. Key Attributes of a Scenario

The IDA research team identified five key scenario attributes that can be considered international best practice. These attributes should be considered the standard by which a scenario should be developed and evaluated prior to approval. A scenario that has all five attributes is likely (but not guaranteed) to be suitable for analysis to support a senior decision-maker.

The five attributes of international best practice are that they are:

- **Relevant** – based on projected force structure and likely military missions. Scenario meets the needs of the senior decision-maker to provide insight to make policy, force structure, analysis of alternatives, and resource allocation decisions. The examination of risk and tradespace requires transparency on the data and assumptions used.
- **Reasonable** – plausible and feasible, including assumptions.
- **Robust** – analytically sound and independent of bias, and will stand up to scrutiny.
- **Reusable** – applicable and repeatable over a variety of studies, and will be staffed and approved for intended use.
- **Responsive** – comprehensive and available when needed to meet analytical and decision-making needs.

1. Relevant

A scenario must be relevant to current Government policy and be suitable for the analysis process to support a senior decision-maker in evaluating risk, examining options, and understanding resource allocation implications. Key characteristics are:

- A scenario should challenge what is planned in the **future force structure**, readiness and the joint operating concepts. Otherwise, the scenario is somewhat pointless as its use in the analysis process will likely not yield useful or relevant information. Analysis

of the scenario should identify the risk with each option, including the current plan (often referred to as Option 0 or the base case) and the resource implications on a life-cycle cost basis.

- The scenario must represent a **future mission** that the Government is likely to ask the Armed Forces to undertake. It is strongly recommended that the breadth of scenarios cover *all* potential missions which the Armed Forces may be asked to participate in, including in a support role, e.g., disaster relief.
- Each scenario should describe the **joint campaign**, joint forces and joint tactics and be approved or vetted by a Joint entity (normally the Joint Staff). There should be no advocacy for a particular Service, capability, or technology. Scenarios will depict the jointly developed ways and means for conducting future joint operations across the range of military operations.
- As previously stated, scenarios should be set **3-20 years into the future**. This enables the scenarios to be distinct from contingency planning, though there can be synergies/overlap between them around the 3-year mark. In some cases, scenarios will need to be set further in the future to enable sufficient time for solutions to be developed – e.g., complex weapon systems such as submarines, which have exceptionally long lead items.
- Scenarios should use information that is based on **projected or programmed capabilities** (friendly and threat) which are derived from concepts, budget projections, military force structure plans, and intelligence.

2. Reasonable

A reasonable scenario will be logical and credible at each step, stage, and assumption. . There should be no "leaps of faith." Key characteristics are:

- The hypothetical sequence of events which leads to a military response (often known as the "road to war," even if the scenario is a peace support or non-combatant scenario) should be **logical, sensible, and plausible**. Ideally, the timelines in the "road to war" will have come from intelligence and represent expected warning times. This may make the scenario subject to higher security markings.
- Any and all assumptions about likely adversaries must be **credible**, transparent, and based on intelligence. As a scenario is set further in the future, it is harder to ensure credibility, and a link to intelligence will help. Otherwise, it is likely that parochial interests will appear with advocates creating enemy forces and tactics to justify a particular force element, capability, or technology.
- Scenarios should be developed in an open and transparent process where **all stakeholders** have the opportunity to provide input and advocate their position.

However, the policy community must exert its authority to ensure that the scenarios are consistent with the Government's policy objectives.

- The **joint concept of operations** for both coalition and adversary forces should be consistent with planned strategy and doctrine. In the case of the adversary, this should preferably be based on intelligence.
- The **environmental conditions** of the scenario must be consistent with the geography and the season. In some cases, the exact time of year will be prescribed for a scenario; in other cases, a study may determine the best time to conduct an operation.

3. Robust

A scenario must be robust enough to withstand scrutiny from the defense community, the wider Government, and increasingly from the public. Key characteristics are:

- The scenario and its challenges should be **independent of component** (military service or branch), provide multiple means of how the Armed Forces may respond to the situation, and not advocate, promote, or "prove" a single capability solution. This independence from component not only adds to the robustness of the scenario but also adds to the reasonableness and credibility of the scenario.
- The scenario must be credible and reasonable, yet **stressful** enough that analysis will identify potential capability gaps and weaknesses in the strategy, doctrine, future force structure, capabilities, technologies, or joint operating concept and tactics.
- A robust scenario will be well documented and able to withstand **scrutiny** and assessment from within and outside the defense community to include independent analysts and advisors.
- A robust scenario will be effective in providing **measurement** space for the analysis to assess concept-based capabilities and proposed DOTMLPF challenges, opportunities, and potential solutions (including credible alternatives).
- If a scenario assumes that there will be a multi-national response, the scenario must reflect the nation's force operating within the larger context of a **coalition** of nations. A key assumption in a coalition operation is who is the framework nation? This determines who has responsibility to provide the Joint HQ and necessary enablers. Similarly, a humanitarian relief scenario should reflect the role and relationship of non-governmental organizations (NGOs) involved alongside the Armed Forces.

4. Reusable

A scenario should be reusable across a wide range of studies, thereby making its development a cost-effective investment which can be used repeatedly to provide evidence-based advice to senior decision-makers. Key characteristics are:

- A scenario should not be developed for the sole purpose of a single study. Each scenario should have **utility** across a broad range of studies and analyses. However, it is not cost effective for all scenarios to be examined by all studies. A study should determine the scenarios it needs to examine to provide a sound foundation for a decision.
- Each scenario should be approved by the proper authorities (often Policy) for its intended use. To provide maximum cost effectiveness, each scenario should be properly **documented**, especially the assumptions. Should a variation of a scenario be used, it too should be properly documented and the differences noted to ensure transparency and consistency.
- A management body (more details later) should **monitor** the use of the scenarios by the various studies and ensure that the scenarios are being used appropriately.
- The **breadth** of the portfolio of scenarios should cover all potential missions for the Armed Forces, all potential environments, and other key aspects such as the framework nation or the use of strategic weapons. Scenarios should be flexible to cover as much of the spectrum of conflict as possible, involving the conduct of decisive actions across the major themes established in concepts and doctrine.
- As previously stated, the scenarios should be **nested** to provide clear linkage from strategic levels to tactical levels, ensuring continuity of policy and assumptions and efficient development.

5. Responsive

A responsive scenario will ensure cost effectiveness and facilitate timely studies, but likely will require central management (of which we will discuss later). Key characteristics are:

- The scenario, including all its assumptions and data, should be readily **available** to a study when needed, without the need for further (lengthy) development. Often this means these details are held in a central on-line repository where access can be monitored and managed.
- The scenario **design** meets the analytical and decision-making needs of the senior decision-maker.
- The scenario has a recognized baseline of data and assumptions that are readily available, but the scenario should be **flexible** enough that a study can conduct analysis of reasonable alternatives. This sensitivity analysis has become increasingly important due to increasing resource constraints and the need to ensure the best value for money.
- Scenario development should be prioritized to ensure availability for critical studies.

G. Structure of Scenarios

There is no set standard for the structure of scenarios across the international community, or that can be identified as international best practice. What is important is that the scenarios are structured to fit the needs of a particular nation.

However, there are **essential elements** that a scenario should cover and have been identified as international best practice, including scenario context, military mission, assumptions, constraints, restrictions, geography, timeframe, timescales, and rules of engagement (ROE). Without these elements, a scenario is likely to be unfit for its purpose and fail an assessment against the five key attributes – relevance, reasonable, robust, reusable, and responsive.

Also, there are several **non-essential, but common elements** to scenarios that will enhance their credibility, utility, and assessment against the key attributes. These include authority for military action, coalition attributes, acceptable variations, and any role of non-combatants.

H. Essential Elements of Scenarios

The international best practice identifies the following as essential elements to a scenario:

Context – a description of circumstances which leads to the need for military intervention. This does not need to be long or cover every detail. A short narrative of several paragraphs can be sufficient.

Military mission – a short statement on the type of military mission to be undertaken.

Assumptions – a list of the assumptions about the scenario including threat forces, coalition forces (if relevant), risk of escalation, and the use of weapons of mass destruction (WMD) (if relevant).

Constraints – actions or activities which the Armed Forces must undertake; for example, protecting the indigenous population or de-mining.

Restrictions – actions or activities which the Armed Forces must not do; for example hot pursuit into an adjacent country or escalating the conflict out of the area.

Environment – statement of the geographic location and weather used in the scenario, often accompanied by a map of the region and a note on any geographical or environmental restrictions. Tactical level scenarios should indicate whether it is a day, night, or reduced visibility operation.

Timeframe – the period in which the scenario can take place. Note that some scenarios may only be relevant for the 3-to-5-year period and others may only be relevant in 5+ or 10+ years.

Time scales – a description of the time-line to the military intervention, which will commonly cover: ambiguous warning, unambiguous warning, partial mobilization, full mobilization, force deployment, force arrival, D-day, H-hour, and V-day.

Rules of engagement (ROE) – a statement of the ROE and under what circumstances they may be changed. If possible, this should include the enemy and coalition forces.

End-state – a statement on the desired end state for the military mission; for example, all entitled non-combatants successfully evacuated, the territorial integrity has been restored, or terrorist's cells/capabilities are destroyed. These usually are provided or endorsed by senior leaders.

I. Non-Essential but Common Elements of Scenarios

International best practice identifies a number of elements commonly used, but are not essential to a scenario. Use of these non-essential elements will increase the utility of the scenario and provide a favorable assessment against the five attributes of a scenario. The non-essential but common elements are:

- A statement of the legal basis or **authority** for the military intervention taking place, e.g., UN resolution, mutual defense treaty, NATO Article 5, etc. This assists in identifying the scope of the mission and the likely rules of engagement.
- If relevant to the scenario, a statement on the contribution from and the role of **coalition** partner(s). As stated earlier, it is important to identify which nation in a coalition operation will be the framework nation and thereby provide the HQ elements and the other necessary capabilities.
- It is desirable from a management and policing perspective to carefully identify and document within the scenario the **acceptable variations**. These are essential for sensitivity analysis or an analysis of alternative options, and help to ensure that studies and analyses stay within accepted parameters while exploring options.
- Commonly included is a description of the role of **non-combatants** and any consequential assumptions or constraints. This should include the size, role, and location of indigenous personnel and non-government organizations (NGOs) such as the Red Cross and Médecins Sans Frontières.

J. Management of Scenarios

Because scenarios play a key role in senior leader decision-making, the scenarios and their development require careful management to prevent abuse, ensure efficient development, and increase cost effectiveness.

It is important is to have a transparent, structured, and active process to develop and manage the scenarios. Ownership and management of the scenarios is normally held within the

Central or Head Office staff – often by the Policy area, although sometimes shared with the Joint Staff. This is likely a dedicated office with the authority and purpose to ensure:

- the scenarios adequately cover the Government's policy and all potential missions which the Armed Forces may be asked to undertake;
- that the scarce scenario development staffs are focused on the leadership's priorities– either for development or review;
- the plausibility of the scenario, and its connection with intelligence and the analyses of future strategic environment;
- that Components use the most current scenarios, polices their use by studies and analysis, and provides essential configuration control;
- that the joint perspective is represented throughout the scenario and there is no bias toward a single service, capability, or advocacy; and
- the development of the scenarios, their oversight, and that their use is open and transparent.

The dedicated and permanent office assigned responsibility for the management of the scenarios can vary significantly in size from 2 to 10+ people and is largely dependent on the number of scenarios, the overall size of the defense institution, and the use of scenarios. The staff should work under the authority of the senior leadership (often the Minister or Secretary).

International best practice is that this office is staffed with active military officers (to provide military views and judgment) and civilians (to provide continuity, impartiality, and analysis). These individuals will have the responsibility and authority to create and update scenarios as they identify gaps in the scenario coverage of policy. In addition, they will manage the scenario documentation, monitor their use and ensure their availability, and work closely and cooperatively with other offices, especially the analytic community.

K. Parochial Interests

While it is clear that scenarios are useful tools in the production of analyses to support senior decision-makers, they are still open to abuse by those looking to promote their parochial interests.

In many cases, the Services and Components may try to manipulate the scenario or the models to bias the analytic process in favor of their desired answer or conclusion. However, central staffs may also attempt to reduce costs or justify a particular force structure, or other outcome.

There are many different ways in which a scenario or the process can be manipulated; vigilance, openness, and transparency are key to identifying and preventing such attempts. Common abuses include:

- Subtle changes to key assumptions or the addition of new assumptions, such as basing options, access to host nation facilities, or warning times;
- Variations to the base scenario which necessitate a particular solution or capability, e.g., enemy forces acquire significant anti-jamming or area denial capabilities;
- Incomplete analysis that does not examine the broader utility of a capability; e.g., only examining Day 1 of a conflict that would favor the contribution of air defense fighters and not close air support or sufficiently stress logistics capabilities (particularly war reserve stocks) that may not become apparent until several days of combat have occurred.

Those supporting the senior decision-makers, the scenario community, and the analytic community have a significant collective interest in identifying and preventing any and all of the above. Such behaviors undermine the credibility of the use of scenarios, the analytic tools, and ultimately the advice to senior decision-makers.

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3. International Use of Scenarios

A. United States

1. Introduction

The DOD has used scenarios for over 50 years. It is a mature process characterized by centralized direction and decentralized execution. Scenarios are used extensively to support studies and analyses, including risk analysis and analysis of alternatives. They were used initially by the components and adopted later by the Joint Staff, Combatant Commands (COCOMs), and Office of the Secretary of Defense (OSD) to support strategic studies.

This "bottom-up" development initially resulted in a decentralized approach that produced studies and analyses that were difficult to evaluate and integrate – particularly at the DOD level. Significant senior leader time was expended discussing the relative merits of the inputs of a study (scenario, data, models, etc.) at the expense of understanding the outputs, the study results. This had serious implications for strategic-level studies and the strategic analysis required to support decision-making by the Secretary of Defense. A major reform effort was initiated in 1995 to rationalize this process and improve the quality and timeliness of the advice provided to the Secretary of Defense. This effort, the Joint Analytic Model Improvement Program (JAMIP), had three primary goals:

1. Produce studies more efficiently;
2. Reduce reliance on *ad ho*c data requests; and
3. Ensure the data used was current and validated.

In spite of its name, JAMIP was more than a model improvement program. It rationalized the inputs to the studies and analysis process to allow senior decision makers to focus on study results – not on whether the scenario and data were valid after the study had been completed.

It recognized that studies and analyses had to be based on situations, assumptions, and data that are acceptable to the analytical community and decision-makers. Because of the time and effort required to develop scenarios, they had to be centrally managed to ensure they were developed in an efficient and effective manner.

As a result, JAMIP produced a process characterized by centralized direction provided by OSD and the Joint Staff, with a requirement that subordinate elements comply with the guidance in the execution of their subordinate scenario development processes and studies.

Specialized offices and organizations located within OSD, the Joint Staff, Combatant Commands, and components collaborate to develop scenarios at the strategic, operational, and tactical levels to support DOD studies and analyses across the enterprise.

2. Principles of Use

Scenario development is focused on the Support for Strategic Analysis process that supports deliberations by DOD senior leadership. In particular, it deals with strategy and planning, programming, budgeting, and execution (PPBES) matters – force sizing, shaping, capacity development, risk analysis, and analysis of alternatives.

Key to the process is that it is transparent and collaborative, that it reflects the Secretary of Defense's policy, Combatant Commander plans, and approved force management decisions. In addition, it is focused on plausible challenges to concept of operations (CONOPS) and forces requiring DOD resources and capabilities.

The process is iterative, following a step-by-step sequence which is co-led by the Under Secretary of Defense for Policy (USD(P)); Director, Cost Assessment and Program Evaluation (DCAPE), and the Chairman of the Joint Chiefs of Staff (CJCS). Where appropriate, scenarios are coordinated with other Federal departments/agencies, and with allies and partners.

The desired end state is to have 12-15 analysis-ready strategic baselines. Of these, 5-6 are near-term scenarios (3 – 10 years in the future and CJCS lead) and 7-9 are future scenarios (10+ years in the future and DCAPE lead). These scenarios are updated every two years to reflect major military, budgetary, or political events.

3. Management

A key development of JAMIP was the establishment of the Support for Strategic Analysis Governance Group (SSAGG) to oversee support for strategic analysis, which meets once or twice a year.

The SSAGG was established by DOD Directive and consists of the USD(P); CJCS; DCAPE; Director, Defense Intelligence Agency (DDIA); and Heads of OSD and DoD Components. USD(P), CJCS, and DCAPE co-chair the group.

Each office has specific responsibilities:

- USD(P) ensures the scenarios are consistent with defense policy, reflect senior leader's policy and decision-making priorities, and approves the scenarios.
- DCAPE is Executive Secretary, ensures that future resource and investment decisions are properly represented, and maintains the repository of scenarios.
- CJCS represents the Combatant Commands' (COCOMs') interests, manages development, approves CONOPS, and provides current force baselines and data on current operations in conjunction with the COCOMs.
- DDIA provides timely, integrated, validated intelligence estimates (with the support of the intelligence community) and validates that assumptions about enemy forces are plausible and appropriate.

- OSD and DOD Component leaders ensure their capabilities and requirements are correctly represented in the scenarios, provide component-specific data, and use the scenarios as starting points for DOD and component-level studies. They also develop, provide, and maintain the tools required to produce component-specific data.

To support the SSAGG, the Joint Analytic Data Management Steering Committee (JADMSC) manages the day-to-day production of scenario products. The JADMSC is established by DoD Instruction and its membership consists of the same organizations as the SSAGG, although the representation is at a lower level and the responsibilities are more specific:

- DCAPE chairs the committee and represents the analytical community. DCAPE identifies the data required to build the scenarios, collects these data from components, maintains the joint data repository, and disseminates data as required. In coordination with CJCS, DCAPE prepares the annual multiyear program to develop force and performance data.
- USD(P) prioritizes scenario development and ensures consistency with current policy. USD(P) identifies the critical planning factors to be used in strategic analyses, including concurrency (number/size/phase of operations underway) and assumed postures of engagement.
- CJCS represents the Combatant Commands and ensures the scenarios reflect the joint nature of warfare. Director for Joint Force Development (J-7) leads development of force and performance data. Every effort is made to ensure data collection activities use existing data collection vehicles and routine production cycles.
- SSAGG and JADMSC bring responsibility and expertise to an open and transparent process that fosters support and significantly improves the quality of the scenarios.

SSAGG scenarios are summarized in the Defense Planning Guidance (DPG). This inclusion in the DPG ensures their availability and linkage to policy and underpins their importance to the defense enterprise.

The importance and contribution of scenarios is well recognized and institutionalized in DOD studies and analyses. It is a relatively stable process with only minor changes made any year to enhance or streamline the process. They are an essential element in the risk analysis and the analysis of alternatives on which the DOD places a significant emphasis as part of investment decisions.

The presence of specialized offices, organizations with continuity provided by civilian specialists, enables management by a relatively small group of analysts. This approach has significantly improved the quality of scenarios and improved the analyses available to support senior-level decision-making – particularly studies addressing:

- Strategic and operational level of logistics – particularly the mix of air and sealift, aerial tankers, and prepositioned equipment/supplies required to support campaign objectives at acceptable cost;
- Forward deployment levels/composition, overall force levels, and active/reserve force mix;
- Impact of technological innovations: e.g., attack helicopters and drones; and impact of doctrinal innovations: e.g., attack of the enemy's second operational echelon.
- Streamlined decision-making for better informed allocation of scarce defense resources, reduced risk and highlighted the impact of doctrinal innovations (e.g., attack of the second operational echelon).

B. United Kingdom

1. Introduction

Conducting studies and analysis using scenarios was adopted by the Ministry of Defence (MOD) prior to the 1998 Strategic Defence Review (SDR), but it was not widespread or well understood. The 1998 SDR brought the use of scenarios and the need for evidence to the forefront of senior decision-making. The SDR was a policy-led, top-down review with which the MoD Ministers were asking for evidence to support the military judgment on the future force structure and investment in new capabilities.

Subsequent years of declining defense budgets, growing costs, and greater transparency and accountability continued the momentum for wider adoption and use of scenarios. Crucially, the sources for this transparency and accountability came both from Defense Ministers and the Treasury.

Management of scenarios is through a formal process by which the scenarios are reviewed to ensure they remain valid to current defense policy. Little change may be required to the scenarios from year to year. However, a change of government or an unforeseen seismic event (e.g., the terrorist attacks in September 2001) usually requires more significant changes.

In the UK, the MoD is recognized as the early adopter of scenarios and the creators of UK best practice. Over the past 15 years, other UK departments started using scenarios, which has been effective in cross-department planning for crisis response – both as a contingent planning tool and for future investment in capabilities.

2. Principles of Use

The 1998 SDR was significant in other ways. One was to champion "jointness" or "jointery" at the earliest stages in defense planning and decision-making. This led to the UK

scenarios having a joint operational concept and no advocacy for any particular service or capability.

There are 30+ scenarios in the UK portfolio covering all potential military missions. Not all scenarios are equal. A key discriminator is whether they are "Core" or "non-Core." A Core scenario can be considered a force-driving scenario, which can be used to justify force structure or capability; a non-Core scenario can only be used to test broader force or capability utility.

Policy guides whether a force structure study or capability analysis must use both Core scenarios and non-Core scenarios. This key policy is under constant review. The selection and policing of scenarios is undertaken and enforced by an office within Policy, which must approve a significant study's choice of scenarios.

The use of scenarios is now widespread across the UK MoD and can be used for technology planning and tactics analysis, but must be used for force structure analysis, capability, and acquisition planning.

3. Management

Within the policy area of the UK MoD, a small staff has the responsibility and authority for the development and management of all scenarios.

A MoD committee meets twice a year to provide oversight and guidance on the portfolio of scenarios, their content, and their use. Members of this committee are drawn from the key users of scenarios – the Head Office, the Services, and the Components. It is an influential committee as changes to the portfolio and/or content of a scenario can have a significant impact on the advice to senior decision-makers. The committee is serviced by staffs within the policy area who have responsibility for the scenarios.

The use of Joint Concept of Operations ensures that from the outset that there is a common baseline which studies and analyses must use. This common baseline includes force levels, lay-downs, and tactics for both friendly and enemy forces.

Since the 1998 SDR, the UK has consistently maintained a tight and strong relationship between the stated policy (published internally to the MoD as Defense Strategic Guidance) and the portfolio of scenarios.

With the demand from Ministers and the Treasury for evidence-based decision-making, the use of scenarios quickly became common and accepted practice. In doing so, there were additional benefits, including enhanced jointness across the Armed Forces - with Jointness instilled earlier in capability and acquisition planning, and more focus on several areas that are commonly overlooked, such as joint enablers and combat service support.

C. Republic of Korea

1. Introduction

The Republic of Korea has limited experience in the development or use of scenarios and efforts to develop scenario-based analysis to support decision making are relatively recent – within the past 5 years.

It is not clear how well known it is that scenario-based analysis can assist senior leaders in their decision-making. The senior leadership of ROK's Ministry of National Defense (MND) may be aware of the utility of analysis, but it seems unlikely that they are aware of the key role scenarios have in that analysis.

While the use of scenarios is not common practice within MND, KIDA apparently is promoting and developing scenarios and their use for "Prioritization Analysis[4]". KIDA clearly recognizes the benefit of top-down planning and the utility of scenarios, but lacks essential senior-level support.

The use of scenarios and KIDA's efforts to produce high-quality scenarios is a positive development and it is important to acknowledge that despite the lack of senior-level support, KIDA has pushed ahead with this effort.

2. Principles of Use

The linkage between scenarios and current ROK government policy may exist, but it is not clear. The IDA research team was informed that KIDA consulted current government policy, using various Policy and Strategy documents, but KIDA considered these to be fairly ambiguous and not particularly helpful for constructing scenarios.

As identified in best practice, scenarios are a cost effective means of assessing the future capabilities of the Armed Forces against likely potential threats. However, it is not evident that the Korean scenarios have been produced using either the planned future capabilities of RoK forces or current intelligence estimates for the capability and intent of adversary forces.

The scenarios appear to be nested, but there are a large number of them, which may be of concern; there may be too many to properly develop, manage, and keep updated:

- 54 strategic threat scenarios (STS);
- Focused on 24 STS with 171 operational mission scenarios (OMS).

There is a process for identifying the priority scenarios based on assessments of probability, impact, relevance, and importance. This process appears to be undertaken within KIDA and there is no evidence as to how these assessments were made, including if they are based on intelligence or (military) judgement. It is important to prioritize the scenarios, as the resources

[4] KIDA conducts analysis to determine a prioritization of the Service approved acquisition programs for MND.

required to develop each scenario can be significant. However, the prioritization process should be transparent, involve the stakeholders, use intelligence, and have clear guidance from senior leaders.

The five attributes of international best practice are present in some form within the scenarios, but they would benefit from additional work to increase credibility and utility. The STS appear to contain the majority of the "essential elements" of a scenario. While some scenarios had a number of elements, not enough evidence was provided to IDA researchers to make a judgement on.

3. Management

The development and management of scenarios is held within KIDA, and not within the MND policy community, which would be in keeping with best practice. The lack of senior-level awareness, participation, and oversight will significantly hamper efforts to have scenarios considered a key component for analysis to assist decision-making.

The various stakeholders of the scenarios may not have been identified and therefore are not participating in the scenario process or development. The lack of participation by the Services and a joint entity (such as the Joint Chiefs of Staff) may result in a concept of operations that will lack credibility and undermine the scenario and any resulting analysis.

The development of a joint concept of operations is crucial in providing a common baseline for analysis of operations such as force levels, force-laydowns, and tactics. This must include the adversary forces and their intent, which should be provided by the intelligence community.

The RoK scenarios under development are all focused on warfighting, an appropriate priority, in view of the current and future threat from North Korea. However, a balance must be struck to represent all the potential missions which the RoK military may be asked by their Government to undertake. IDA researchers were informed that cyber missions are considered within the warfighting scenarios and that Peace Support scenarios have been identified, but neither have been developed due to limited scenario development resources.

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4. Comparison with International Best Practice

This section compares the U.S., UK, and RoK approaches against the international best practice scenario attributes of relevance, reasonable, robust, reusable, and responsive.

The analysis will illustrate that the U.S. and UK approaches favor very well against the attributes. This is not surprising as both nations have used scenarios extensively for over 15 years. The focus is therefore on providing constructive criticism on the RoK approach.

The analysis uses a color coded system for ease of reference in gauging the use of the attributes:

Table 1. Color Key for Analysis

●	Good – No issues
●	Acceptable – Minor issues
●	Significant issues
●	No evidence, unable to form a view

A. Relevant

Table 2. Analysis of Relevant Attribute

Attribute	RoK	U.S.	UK
Projected Force Structure	●	●	●
Military Missions	●	●	●
Joint Endorsement	●	●	●
Timeframe	●	●	●
Projected Capabilities and Concepts	●	●	●

U.S. Comment – Scenario development time is influenced by several factors, particularly scenario complexity and priority. The goal is to update strategic scenarios at least every two years.

UK Comment – The balance of the scenarios across the various military mission types has changed over time. Initially, the focus was on regional conflict, but as the UK got involved in

more peace support operations and limited interventions, the balance changed to reflect these real-world events and changes of Government priorities.

U.S. and UK Comment – Scenarios can be used to promote the parochial interests and pre-established positions of the Components. This can manifest as choosing a particular set of scenarios for analysis, intentional misunderstanding of assumptions, or the use of unauthorized variations. These are often difficult to identify and requires central staff to be vigilant in examining the detail of a components' scenario and modelling processes.

RoK Comment –Eight threats are identified, including "peace operations overseas," but all available scenarios are warfighting. A balance must be struck to represent the potential missions for RoK military.

There is no evidence that the scenarios, their concept of operations, etc., are joint or vetted by a joint entity. Note that it is extremely rare for a Service or Component to operate separate and independent of other Forces.

No timeframes are identified in any of the scenarios, which suggest that are all are valid today. However, with no timeframes identified it is not possible to determine the projected capabilities and concepts for use in the scenario and its analysis.

B. Reasonable

Table 3. Analysis of Reasonable Attribute

Attribute	U.S.	UK	RoK
Plausible	●	●	●
Credible	●	●	●
Consensus	●	●	●
Concept of Operations	●	●	●
Environment	●	●	●

U.S. Comment – The time required to thoroughly develop scenarios creates a constant tension with achieving stakeholder consensus and maintaining a sufficient repository. The prioritization established by USD(P) keeps the focus on the most important scenario development efforts. This tension, however, emphasizes the importance of keeping the inventory of necessary scenarios as small as possible to ensure they are kept up to date. Quality must be maintained over quantity. Otherwise, the scenario will be questioned and could compromise the results of the study it supports.

UK Comment – Within the UK, consensus is normally achieved on a particular scenario, but on rare occasions the Policy community who own the scenarios will overrule stakeholder objections. These objections can be a result of parochialism and/or advocacy from the Services. The Policy community must be confident that the scenario is consistent with policy, and plausible and credible before overruling such objections.

RoK Comment – The scenarios seem credible, but there is a lack of detail on the events leading to the need for military intervention and also a lack of clarity about assumptions. While there is a clear placeholder for the Concept of Operations, it is unclear how without Service support, these can be truly representative of current and future doctrine. These are important for overall credibility, rules of engagement, potential restrictions, and constraints.

There is no evidence of consensus or that any stakeholders support the scenarios. It is not clear if there is collaboration with stakeholders, which reduces the utility and likely adoption of the scenarios or the analysis flowing from them.

C. Robust

Table 4. Analysis of Robust Attribute

Attribute	U.S.	UK	RoK
Independent of Component	●	●	●
Stressful	●	●	●
Scrutiny	●	●	●
Measurement	●	●	●
Coalition	●	●	●

U.S. Comment – The study sponsor is responsible for determining the scenario(s) to use. In some cases, an excursion/variation from an approved scenario may be developed. Robust scenarios reflect the reality of current and projected operations – always joint and usually with coalitions. The collaborative nature of their development ensures close scrutiny. The formalized development process also produces a well-documented scenario and repository for ensuring the details are available to support studies and analyses when desired.

UK Comment – The majority of UK scenarios has the UK Armed Forces operating as part of a coalition and therefore makes important assumptions about coalition contributions and their role in the scenario. In particular, the UK scenario identifies the Framework nation and thereby provides the majority of HQ elements and infrastructure. These assumptions are carefully documented and stated as part of the scenario information.

Over the years, the UK has developed a robust form of scrutiny for the use of scenarios:

- The policy community scrutinizes and approves the use and mix of scenarios for any significant study or analysis.
- The finance area scrutinizes the study or analysis process/tools to ensure they are objective and that the particular mix of scenarios for a study or analysis is "fit-for-purpose" and will address the issue under examination.

RoK Comment – The lack of jointness enables the scenarios to be misused and advocate for a particular capability or solution. While the scenarios would appear to stress the RoK forces, more detail on the threat and their intentions is needed. It is difficult to perceive that all of these scenarios would withstand independent scrutiny, due to no clear linkage to policy, a lack of detail, assumptions, and jointness. The lack of detail on some key elements would prevent analysis of capability and capacity in a repeatable and robust manner, including on the role the United States is expected to play. However, IDA researchers were informed that there is significant detail provided about U.S. forces.

D. Reusable

Table 5. Analysis of Reusable Attribute

Attribute	U.S.	UK	RoK
Utility	●	●	●
Well documented	●	●	●
Monitored	●	●	●
Breadth	●	●	●
Nested	●	●	●

U.S. Comment – Detailed scenario repositories at both OSD and component levels provide timely study support. The number of scenarios available provides a comprehensive library to support studies at the strategic, operational, and tactical levels of war in all potential geographical or environmental situations.

UK Comment – The portfolio of scenarios have a range of classifications (security markings: Official, Secret, Top Secret). This is largely determined by their purpose and any intelligence used to create the scenario, the "road to war," and information about the adversary. Typically, scenarios for use in a multi-national forum will have a low classification; those UK-only scenarios and those for strategic weapons are highly classified.

RoK Comment – Scenarios generally have been developed for use in multiple studies and analyses. There are several "essential elements" missing from the scenarios and a general lack of detail. However, the lack of detail will make utilization difficult, as repeatability will be low.

It is recognized that there are eight threats, but the scenarios available only appear to deal with warfighting threats and not the potential wider utility of the RoK Armed Forces. It is not clear that these scenarios are developed, supported, or monitored outside KIDA. While there may be too many scenarios to be developed and kept up to date, there is a link between the scenarios and their variations which could be easily nested.

E. Responsive

Table 6. Analysis of Responsive Attribute

Attribute	U.S.	UK	RoK
Available	●	●	●
Design	●	●	●
Flexible	●	●	●

U.S. Comment – The process is highly responsive. The availability of specialized scenario development offices and organizations provides considerable capacity to satisfy steady-state requirements as well as react to unanticipated, high-priority analytic baseline needs. The library of available scenarios is maintained in the repository and provides the study community with considerable flexibility. The scenarios are available on the DOD Secret Internet Protocol Router Network.

UK Comment – It has already been identified that approved variations are an important part of a scenario, as they underpin risk and sensitivity analysis as well as the consideration of options. The UK monitors this carefully, as experience suggests that variations are a source of parochialism and advocacy. It is recognized that analysis of plausible and reasonable variations can provide important insights. These approved variations are documented and made available to others, reducing future costs and ensuring commonality across studies and analysis. The scenarios themselves are available on the secure MoD-wide network.

RoK Comment – The scenarios and their (limited) details appear to be widely available within KIDA. Due to the lack of clear linkage to policy and prioritization, it is unclear if the design of the scenarios would meet the needs of the senior leaders. While there is no "baseline" scenarios identified, this could be achieved through careful "nesting" of the scenarios and documenting the acceptable scenario variations.

F. Other Observations

1. United States

Scenario development is time and labor intensive. It is important to develop only those that are needed and can be kept updated. When development resources are stressed, it is important that efforts are focused on scenarios required by the most critical studies. Experience has shown that a focus on quality rather than quantity better supports the studies and analysis process.

Vigilance is required to counter attempts by parochial interests to manipulate scenarios to support pre-determined conclusions. Study proponents can be very creative in masking questionable and non-approved changes in the scenario details to favor a desired outcome.

The U.S. approach works well in stable strategic situations:

- However, strategic or doctrinal ‘shocks’’ cause disruptions due to the reaction time required to reflect changes in scenarios.
- Organizations focused on identifying revolutionary changes (e.g., net assessments) can help think about such shocks but cannot eliminate them. The scenario process requires resiliency to accommodate shocks.

2. United Kingdom

Over the past 15+ years, the UK has established a mature and stable scenario process which provides evidence-based advice to senior leaders. The process and the scenarios are under constant review and scrutiny so as to ensure their relevance and effectiveness.

Central to the success was senior leaders demanding an approach that the advice be based on a credible, repeatable, objective, and transparent process. Without that clear pull from the senior leadership, it is reasonable to assess that the UK process would not be as advanced, influential, or central to the MoD’s planning as it is now.

A more recent development is the UK’s investment in institutionalizing joint campaign development as part of the scenario management process. Led by the analytical community (Defence Science and Technology Laboratory, a wholly owned agency of the UK MoD) it supports the development of a joint campaign plan which serves as the analytical baseline. The development process is transparent and inclusive of the Services and Components who play a key role in representing future doctrine, tactics, force structure, and capabilities. Having established this baseline and making it widely available has reduced the cost of studies as they can focus on appropriate variations and deviations, and not the baseline analysis.

3. Republic of Korea

Scenario development and their role in underpinning analysis for senior leaders are in its early stages. Not being widely understood or supported would indicate that there is more work to be done in education and awareness of key stakeholders and senior leaders.

This has not prevented KIDA from making major strides in scenario construction and development. Down-selecting and prioritizing the scenarios help to focus limited scenario development resources, but the process appears to rely on judgement on priorities and likelihood and not from senior leader input and intelligence.

The construct of the scenarios are a strength of what has been achieved to date. However, there are a number of "essential elements" that were not evident. They may be present in the KIDA scenarios, but there was no evidence from which to judge. If these elements are not present, it reduces the repeatability of scenario-based analysis, thereby increasing the cost of analysis and the opportunity for parochial interests to be advance. A summary is presented below.

Table 7. Analysis of Republic of Korea Scenario against Essential Elements

Essential Element	RoK	Comment
Context	●	There is a brief statement on the context which would benefit from being more descriptive to increase the credibility of scenario.
Military Mission	●	It is clear that each mission is war-fighting. Unclear if there are scenarios which address the other mission types.
Assumptions	●	No evidence.
Constraints	●	No evidence.
Restrictions	●	No evidence.
Environment	●	There is limited description of the area of operations.
Timeframe	●	Timeframe is clearly identified in the scenario.
Time scales	●	There is a lack of detail on the events leading to the need for military intervention.
Rules of Engagement	●	The concept of operations provides some guidance.
End-state	●	The Strategic/Operational Objective and concept of operations describes the desired end-state.

Additionally, there would appear to be a number of ‘‘non- essential elements” missing, which would further compound the scenario repeatability and utility. A summary is presented below.

Table 8. Analysis of Republic of Korea Scenario against Non-Essential, but Common Elements

Essential Element	RoK	Comment
Authority	●	No evidence.
Coalition	●	Clearly identifies if US forces are expected to participate. Not clear if this is underpinned by specific US force structure and US ConOps.
Acceptable Variations	●	While not specifically listed, the larger number of STS and OMS could be condensed by considering some as “Acceptable Variations”.
Non-combatants	●	No evidence.

The absence of “Authority” could influence the CONOPS and RoE of RoK Forces. The role of non-combatants is likely to be significant in all of the scenarios, especially for RoK forces and actions. The large number of scenarios could be reduced to a more manageable number by identifying a small number of “baseline” scenarios with a list of nested scenarios and acceptable variations.

G. Management of Republic of Korea Scenarios

The analysis and comments on the management of RoK scenarios is divided into two sections that follow. It is believed that this will aid understanding and focus attention on the relevant areas.

1. How to Develop Scenarios

- It is not clear what, if any, senior-level oversight, participation or endorsement is being provided within KIDA and the wider MND.
- KIDA is developing the scenarios and conducting the scenario analysis with limited input from JCS, the Services or senior leaders.
- There is a lack of a clear linkage to current policy, threat environment, and the scenarios – in particular the judgement on the priority threats (the criteria for the down selection from 8[5] threats to 4).
- There is no dedicated office to oversee scenario development and use.

[5] The 8 threats are classified and were not made available to the IDA research team.

- It is not clear who is developing the (Joint) Concept of Operations and providing a joint, common baseline, including force levels, force lay-downs, and doctrine. This raises concern over military credibility, the role of the Services, and ultimately the usefulness for senior leaders.
- The legitimacy of the threat information (intent, force structure) and their concept of operations are unclear, which adversely impacts the credibility of a scenario.

2. How to Use Scenarios

- With so many scenarios and no prioritization, it is not clear which scenarios a study should use and why.
- The resources required to conduct analysis with so many scenarios is substantial and beyond any Governments capabilities. A smaller number of scenarios would be more than adequate to support MND/KIDA studies and analyses.
- The large number of scenarios would make it easier for parochial interests to find and use scenarios to create biased support for their particular capability or issue.
- The identification of a small set of "baseline" scenarios would significantly increase utility and reusability, and create a larger set of "nested" scenarios with acceptable variations. For example:
  - NK invade with no warning, conventional conflict (baseline):
    - China provides satellite imagery to NK (acceptable variation);
    - NK maritime forces conduct area denial operations (nested).

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5. Recommendations for Republic of Korea

A. Approach

1. **Senior Leaders** – Senior leaders should be briefed on the benefits of an evidence-based approach to decision making and the key role that scenarios contribute. Their support of the approach and use of scenarios will facilitate greater participation and adoption of scenarios.
2. **Linkage** – There should be clear and transparent linkage between each scenario and an extant Government policy or strategy. The threat information (force structure and concept of operations) should be informed by intelligence, even if the resulting classification restricts availability.
3. **Joint** – The scenarios should be joint from the outset and promote joint approaches, concepts, and capabilities; there should be no presumption of a single service solution. Initially, this might require clear and specific guidance in the scenario about jointness.
4. **Stakeholders** – All stakeholders should participate in the development of scenarios from the outset. Participation will reduce concerns about the origins and relevance of a scenario, and help increase their adoption and the acceptance of subsequent study analysis/assessment.
5. **Quality**– An independent body (could be just one person) should review the scenarios and their use. The focus should be on scenarios meeting the five key attributes (relevant, reasonable, robust, reusable, and responsive).

B. Scenario Construction

1. **Assumptions** – Assumptions are necessary to reduce the large number of variables that scenarios must address. They should be recorded and made available to others for transparency and scrutiny. Documenting of assumptions increases the credibility and reusability of the scenario. Analysis should include determining if any one assumption dominated the results. Key assumptions should be approved by Senior Leaders.
2. **Constraints/restrictions** – Identifying and recording any constraints (must do or not allowed to change) and restrictions (must not do) will help ensure the scenario is properly used, avoid abuse, and increase its reusability.
3. **Timeframe** –Each scenario should identify the timeframe of when it is valid. This will shape the conditions (economic/military/capability) within the scenario for both RoK and enemy forces. There should be a balance between mid-term (3-10 years) and longer term (10+ years), with the balance leaning towards more mid-term scenarios than longer term.

4. **Authority/Rules of Engagement** – The legal basis for the military mission should be recorded, as this will help define the RoE. The RoE should be explicitly stated within each scenario, as it provides essential guidance on what military actions are/are not acceptable.
5. **Non-combatants** – The role of non-combatants can be significant in most scenarios. It is recommended that non-combatants be identified within the scenario, providing both their numbers, location, and impact on military operations. The approach and responsibility of RoK forces to these non-combatants should be stated.

C. Management

1. **Office** – It is recommended that a (small) office be identified as having the responsibility to develop, manage, and coordinate scenario development with stakeholders, and their subsequent use by studies. This responsibility should be supported by senior leaders and be widely known. The individuals within the office should preferably be a mix of civilians and active-duty military.
2. **Scrutiny** – In order to increase the quality and legitimacy of the scenarios, it is recommended that a formal process of scrutiny and review be established. This does not need to be burdensome, but a review that is independent of those developing the scenarios will help ensure the scenarios are relevant, credible, and not representing parochial interests.
3. **Availability** – Those responsible for managing the scenarios should make the scenarios as widely available as possible. The availability of the scenarios will facilitate openness and transparency, which likely lead to a greater use of the scenarios and the corresponding analysis.
4. **Baseline Scenarios** – It is recommended that a small number of scenarios be identified as "baseline" scenarios which all studies must use. These should be identified based on priorities from senior leaders and current policy/strategy. They should be fully developed, well documented, and widely available.
5. **Number** – A small number of high-quality scenarios is more useful, and will have greater credibility with senior leaders than a large number of lower-quality scenarios. Therefore, it is recommended that, based on policy, a small number of scenarios be identified and fully developed. Down-selecting scenarios should be based on Senior Leader priorities, assumptions and ensuring a reasonable worst case is covered. It is not worthwhile developing more scenarios than can be analyzed.

D. Implementation of Recommendations

It is recognized that the above recommendations cannot be the sole responsibility of any one organization; however, it is important to indicate which organization should lead the effort – KIDA or MND. The most important factor is senior leadership ownership of the scenarios and analytic processes as critical inputs to decision-making. Additionally, the resources to undertake all these recommendations simultaneously could be significant. Therefore, the recommendations have been prioritized into four groups: Priority 1 should be addressed first; Priority 4 addressed last.

Table 9. Prioritized Recommendations

	Number	Recommendation	KIDA Lead	MND Lead	Priority
Approach	1	Senior Leaders		✓	1
	2	Linkage	✓		2
	3	Joint		✓	2
	4	Stakeholders		✓	2
	5	Quality	✓		3
Construction	6	Assumptions	✓		2
	7	Constraints/restrictions	✓		3
	8	Timeframe	✓		2
	9	Authority/Rules of Engagement	✓		4
	10	Non-combatants	✓		4
Management	11	Office		✓	2
	12	Scrutiny		✓	2
	13	Availability	✓		3
	14	Baseline Scenarios		✓	3
	15	Number	✓		3

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6. Summary

Scenarios can make a value-added contribution to providing robust and independent analysis to senior decision-makers. They are a key tool in managing risk, examining alterative courses of actions, and making resource allocation decisions. However, there is not a standard or template for designing the process of developing and using scenarios. Each nation must design a process which suits the needs of their senior leaders and dedicate the right level of effort to create and service the scenarios.

Analysis of international best practice has identified five key attributes that a scenario should be benchmarked against. Scenarios must be relevant, reasonable, robust, reusable, and responsive. Should a scenario have all five key attributes, it is likely (but not guaranteed) to be suitable for analysis to support a senior decision-maker.

The process adopted should be open and transparent with an opportunity for all stakeholders to participate. This will improve the quality of the scenarios and increase their adoption/use.

Additionally, management of the scenarios, their development and use, is just as important as producing quality scenarios. Best practice has shown that quality is more important than quantity and that scenario management should be held centrally, preferably by the policy community.

The United States and the United Kingdom have institutionalized the use of scenarios into the process of providing senior leaders with objective, evidence-based advice to manage risk, examine options, and make resource allocations. A significant reason for this success is that these same senior leaders have championed the use of scenarios from the top of their organizations.

Both nations have used scenarios for 15+ years and as a consequence have well-developed and executed processes and management. They are mature and robust to challenge, but are different to each other in execution due to their different laws, structures, etc.

It is not recommended that any nation attempt to copy the U.S. or the UK, but rather use the five key attributes, the essential elements, and the common but not essential elements, to create a process and management system which suits their needs, ensuring it has close ties with current policy and is managed closely and vigilantly.

KIDA has adopted scenarios within some of their analysis (e.g., Prioritization Analysis); however, the value and use of scenarios is not widely understood within RoK MND or KIDA. This is largely due to a lack of senior leaders demanding evidence-based analysis and their involvement in scenario development. This must be addressed as a priority to implement as a

first step to an effective process for analyzing the program of record against the most important missions.

The approach taken by KIDA is in the right direction and a number of key improvements will build on that progress and significantly strengthen the Korean use of scenarios, including:

- A formal process, office, and responsibilities should be established for scenario development and management.
- Focus on a smaller number of high-quality scenarios with a clear linkage to senior leader priorities and defense policy/strategy.
- The international best practices identified 5 key attributes which a RoK scenario process would benefit from adopting.
- KIDA's current scenario construct would benefit from the addition of several elements from the international best practice.

The recommendations from this document cannot be undertaken solely by KIDA and will require the support and participation of others within RoK MND.

Although it involves organizational and process challenges, the adoption of this scenario development approach can significantly strengthen the Korean analytical community's ability to support senior leader decision-making. The experience of the United Kingdom and United States has demonstrated that the return on this investment is substantial. Well-written scenarios are a critical step in evaluating the Korean defense program and identifying cost-constrained alternatives to reduce risk and provide the capabilities need to satisfy the national security strategy.

Appendix A
Illustrations

Figures

Tables

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Appendix B
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Appendix C
Abbreviations

CAPE	Office of the Secretary of Defense, Cost Assessment and Performance Evaluation
CJCS	Chairman of the Joint Chiefs of Staff
COCOM	Combatant Command
CONOPS	Concept of Operations
DCAPE	Director, Cost Assessment and Performance Evaluation
DDIA	Director, Defense Intelligence Agency
DOD	Department of Defense
DOTLMPF	Doctrine, organization, training, material, leadership, education, personnel, and facilities
DPS	Defense Planning Scenarios
FRVS	Force Requirements Verification System
ICW	In conjunction with
IDA	Institute for Defense Analyses
JADMSC	Joint Analytic Data Management Steering Committee
JAMIP	Joint Analytic Model Improvement Program
KIDA	Korean Institute for Defense Analyses
MOD	Ministry of Defense
NATO	North Atlantic Treaty Organization
NGO	Non-governmental organization
OSD	Office of the Secretary of Defense
PPBES	Planning, programming, budgeting, and execution system
SDR	Strategic Defense Review
SSA	Support for Strategic Analysis
SSAGG	Support for Strategic Analysis Governance Group
UK	United Kingdom
US	United States
USDP	Undersecretary of Defense for Policy

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14. ABSTRACT

The Institute for Defense Analyses (IDA) has assisted the Korean Institute for Defense Analyses (KIDA) in identification of international best practices in defense strategy, planning, and resource management. As part of this effort, this document identifies international best practices for defense planning scenarios, and in particular, their usage in the United Kingdom (UK) and United States. It defines scenarios; specifies their role in supporting defense management decisions; identifies best practices for the development and management of scenarios; and examines their role in the UK and United States. Finally, there is an in-depth analysis of KIDA's approach to scenarios using the identified international best practices with specific recommendations for improvement in the approach, scenario construction, and scenario management.

15. SUBJECT TERMS

Scenarios, defense planning scenarios, international best practice, Korean Institute for Defense Analyses, scenario development, scenario construction, and scenario management

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