

**SCENARIOS IN OPERATIONAL ANALYSIS AND LONG-TERM  
PLANNING. A NECESSARY TOOL OR A CREATIVITY  
CONSTRAINING STRAIGHT JACKET?**

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**by**

**Director of Research Ragnvald Solstrand  
Norwegian Defence Research Establishment**



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### **1 POINT OF DEPARTURE**

For today's practitioners of OA and force structure analysis the word scenario is among the most frequently used in our professional jargon. Scenarios come in different wrappings for a whole range of good purposes; for quantitative analysis and for gaming, for the overarching strategic down to the sub-tactical level, with a long-term, medium-term, and very short-term horizon. Like most other things that pervade our everyday life, we soon stop wondering about what they really are and why they are there.

If God had created scenarios for us to live and die with, like the sun in the sky or a natural disease, that might not have been such a bad thing. But we, the analysts, have created scenarios and continue to breed them and feed them. Therefore it may be wise sometimes to make a halt, take one step back, and with an open mind reconsider the qualities of this creature and whether it serves good purposes. If my presentation here today could generate an impulse towards such a constructive reconsideration of our use of scenarios, I would be very happy.

### **2 DO WE ACTUALLY HAVE A PROBLEM?**

I realize that this might sound as if I think we have a severe problem. My assessment of the current state of affairs is that we have a potentially threatening problem coming up. Today we cannot point our finger at one particular problem which is about to put the vitality of our profession at jeopardy. However, that might well happen further down the road if we allow a careless – or even unconscious – attitude to develop. So, to use the terminology of my friend the doctor, I am advocating a prophylactic approach to save us the tremendous cost and pain of later therapeutic treatment.

In my opinion, what are the symptoms of this sneaking disease? Or, in other words, what are the main pitfalls in our use of scenarios for analytical purposes? To explain that, I need first to emphasize that I see scenarios as an instrument for analysts to help them deal with an uncertain future in an orderly and traceable manner.



Since our “raison d’être” is to identify good solutions for the future, and hopefully also to rank options according to their utility and cost, we must have some way of being specific about what the future might hold. This led us to adopt the following basic approach; We describe a set of alternative scenarios that would cover the whole range of relevant and plausible futures. Then we test our solutions against each and every one of these futures, hopefully being able to identify the best solution across the entire spectrum of scenarios.

Let me hasten to add that here I use the term “we” to mean the Norwegian military OA community. However, it is my impression that the same basic idea also underpins the scenario approach adopted in many other countries, although there may be other schools of thought that I am not fully aware of. Any way, I shall use this, probably the most common principal approach to the application of scenarios for future-oriented analysis as the basis for my discussion of problems and pitfalls.

### **3 WHAT COULD GO WRONG?**

Looking at the current practice, both in Norway and in OA organisations in other countries that I have some knowledge of, we could identify four different lines of development that could lead to severe problems and even threaten our credibility and professional standards. For short we could identify them by the following headings:

- 1) Jamming by scenarios
- 2) Flawed scenario selection
- 3) Scenarios as predictions
- 4) Scenario officialism

Before I take a quick tour through these alleged minefields, let me reassure you that I am not against scenarios, neither on principal nor on practical grounds. Quite to the contrary, I am convinced that we need them. That is why I think we should take the trouble to consciously examine how we use scenarios and make ourselves aware of the risks of detrimental malpractise.

#### **3.1 Jamming by scenarios**

The security landscape that has developed since the end of the Cold War is very complex, and the next 10-20 years hold few promises of a simpler world. This implies that we will need a very large number of different scenarios to provide a reasonably good coverage of



what we might need our defence for in the future. Even for a small country like Norway, with limited international ambitions and a relatively transparent national security context, this becomes a problem. In the latest national long-term force structure analysis (Defence Analysis 2000) our analysts cooperated closely with the military intelligence community to develop a sufficiently broad range of scenarios. It was concluded that a minimum of 15 scenarios were required, and there was pressure to develop several more.

Writing a good scenario, internally consistent and with the necessary realism and detail, is a demanding task. Most military OA-organisations that I know of would easily get bugged down for a long time in such a task. Contracting this kind of work out, either to the military side of the house or to some external experts is not a good option. In most countries such expertise is available only in very limited quantities – if at all. And even if it was available, I don't think it is acceptable for the analysts to play only a secondary role in creating scenarios for our own analysis. Much of the value of scenarios lies in the insight and broader understanding created in the process of developing them. Furthermore, scenarios need to be formulated with a clear understanding of the subsequent analytical process which the scenarios are ment to support. So, if we really think that scenarios have an important role to play in our analysis, we – the analysts – should make sure that we are intimately involved in the process of creating them.

If full range scenario development is a demanding task, analysing them all easily becomes totally overwhelming. Faithful to our basic ideas, we should test all the good solutions that we can come up with, against the whole spectrum of scenarios, fearing that anything less would render our analysis vulnerable to prejudice, random prioritisation, and even manipulation. But very few – if any – OA organisations enjoy the luxury of having sufficient resources to do all this analysis in the time available. If we set out with a totally unrealistic ambition, we are likely to find ourselves in one of the following two undesirable situations when time is up; Either we would have covered only a very small fraction of the identified scenario-solution space, or we have just skimmed the surface of all of it, but done a very lousy job. The direction and prioritisation of our limited analytical capacity has been totally missing, or at best partly random. I guess most OA groups would, under such circumstances, tend to incert some priorities by focusing on the solutions and scenarios that they have experience with and where proven analytical tools are available. Not necessarily a sound practise in times of change. So, in short this kind of



approach, which is not unfamiliar to most of us, could render an OA-organisation in a severe state of jamming, unable to finish the tasks we take on, and unprepared to make the necessary priorities to guide our work.

### **3.2 Flawed scenario selection**

This line of thinking leads to the conclusion that to deal with scenarios in a rational way in practical analyses, we must be selective. This might sound straight forward. We just have to choose a small number of scenarios which we can handle within our capacity and time limits. However, we must realize that this simple statement implies a fundamental breach with our basic approach so far. We can no longer deal with our scenarios as if in total they represent all relevant futures. The fact is that the way we select our few scenarios most likely will affect our results and conclusions very strongly. Once this is clear to us, we should concentrate on how to set up the scenario selection process in the best way.

However, available experience so far indicates that there is a significant risk of having this selection process flawed in different ways.

Two different lines of thinking are possible. We could either select scenarios based on what challenges and tasks they represent for our defence, or on an assessment of the probability that they will occur. The former line is problematic because it forces us to adapt a normative analytical approach, the latter because we have a very insufficient basis for assigning a priori probabilities to different future developments.

Why is a normative analytical approach difficult – or rather undesirable? Basically because analysis should come first, and be as open and unbiased as possible about what our defence forces should do and how to do it. Based on this, the normative part should be dealt with by the decision – makers, deciding on the relative priorities of various tasks and how well we should be able to do this job. Deciding on ambitions for our defence is the same as deciding on resources available, and this is definitely a political and not an analytical task. There are several good examples, or rather bad examples, from force structure analysis in my own country of how this can create fundamental problems. The analysts and the military focus on a few so-called dimensioning – or decisive – scenarios which we think our forces must be able to deal with in a specific way. The analysis proper identifies a cost-effective force structure to reach this goal, and a long-term price tag is attached to it before we send it to the politicians – who consistently fail to provide the



necessary resources. I see some merits in an iterative process of this kind between analysts and decision-makers, which hopefully would converge towards a consistent total solution of what to aim for, how to do it, and what it will cost. However, it is my impression that in most countries today this is nothing but wishful thinking.

But even if we could make this happen, there is another severe snag: What if the future turns out to be quite different from the few dimensioning scenarios that the analysts and the politicians have converged towards? So, all in all, we can not escape the probability issue, and the logical thing would be to face it head on in an orderly and structured way. To my knowledge evidence of such an approach is not abundant in today's military OA, which is understandable given the principal and practical problems involved. But it is difficult to understand why we are not more concerned about the consequences.

Our fundamental problems in this area are two-fold. First; To assess a priori scenario probabilities, the military OA community must have its own expertise in foreign and security policy, which is today in short supply in most countries. And once again, outsourcing of such a fundamental basis for our analysis is not recommendable. Second; Even if credible probabilities were available, we do not have a practical analytical approach which allows us to use them in a meaningful way. How do we actually scale the different force structure elements according to scenario probabilities?

The standard approach followed seems to imply that all scenarios we use for analysis have approximately the same probability of occurrence in the actual planning period. This probability is high enough to warrant consideration, while all other relevant scenarios have a much lower probability so that we can safely disregard them. In Norway we have suggested a possible improvement to this "zero-one" approach, but so far without much success in actually implementing it. The idea was to further divide the non-zero probability scenarios in two categories. The most probable category A scenarios would be used in a first round of analysis to establish the main priorities and allocation of the bulk of resources. The less probable category B scenarios would then be analysed to check whether major improvements in force effectiveness could be obtained through a minor reallocation of resources.



### **3.3 Scenarios as predictions**

This might inspire us to take another step away from the idealized scenario approach which was our starting point. Our problems with scenario probability would be gone if we could find somebody capable of predicting the future. Predictions is however, very much a taboo word among analysts and scenario experts. We insist that scenarios are not predictions, but rather exemplifications of points in the multi-dimensional space of possible futures. But if the number of scenarios we actually use for our analyses is very small, and our analytical approach is such that at any time there is a dominating emphasis on one particular scenario, what then is left of the fundamental and principal difference between our scenarios and a prediction?

I believe that the everyday reality of military OA in NATO and many nations is not far from such a situation. And that might not be so bad, if only we were willing to admit that we are de facto making predictions and then tried to do so consciously and to the best of our ability – neither of which seems to be the case today. We consequently fool ourselves by insisting that in due course we will cover sufficiently many scenarios. And we make questionable predictions, mostly assuming that the next war is going to be very much like the last one. I know that this is an over-simplified picture, and that it is unfair to blame everything that is wrong on the analytical community. Somehow we must respond to our military customers, who at the moment are – and rightfully so – very much concerned with the Balkan conflict. However, we must also look beyond the Balkans. We, the analysts, have an obligation to contribute to maintaining a broader and longer-range perspective for the analysis we do in support of national as well as NATO force structure development. And in fulfilling that function we must find effective countermeasures to the trend towards using scenarios as more or less singular point predictions. How to do this requires a rather penetrating analysis of its own. The answers will most likely differ between the various analytical communities, but the common denominator is to be found in refocusing on what scenarios basically are ment to be – namely tools for dealing with future uncertainty.

### **3.4 Scenario officialism**

Under this heading I shall describe a trend which is increasingly distinct in many NATO countries. The responsibility for developing scenarios is taken over by some formal body in the planning organisation. A limited number of scenarios are officially approved for



analytical use. This implies that the scenarios get to be an official national statement of future threats and what wars the country thinks it might have to fight, which in turn creates problems of sensitivity and classification in the use of and communication about scenarios. These problems can be overcome. I am much more concerned about two other possible complications; the risk that analysts will be totally decoupled from scenario development, and that the whole process will be overly bureaucratic, too slow in responding to changes, and haunted by power struggle. I have already underlined the importance of analysts being actively and constructively involved in scenario development. As for the consequences of bureaucratisation, they can range from serious, but acceptable to totally devastating – depending on how the process is organised, controlled and – not the least – manned. I am particularly concerned about the possibility of having the process infiltrated by sector interests, whose primary goal is to defend scenarios that favour their own narrow interests – and discredit those that would favour their most feared competitors in the struggle for resources. But also the fact that bureaucratic organisations are known to have a strong tendency to become rigid and lose their openness and creativity, gives reason for concern.

I must add that the development towards more scenario officialism certainly has its bright sides. A well-proven and fully accepted formal process would certainly contribute to the standing of the scenarios we use, and thereby to the legitimacy and impact of our analysis. But all in all, my concerns for what this development in the long run could lead to far outweigh the possible positive effects.

#### 4 ARE THERE ANY ALTERNATIVES TO SCENARIOS ?

Considering all these things that can go wrong in our application of scenarios for OA, may we should try to get rid of them and start afresh? My answer is no, we should not and could not drop scenarios all together, but yes we must examine our approach, to counter the negative trends and even start all over again in some respects. And we can do most of what is required within the analytical community itself, without asking for permission and seeking additional funding.

First, we must fully realize that good and helpful analysis must explicitly take account of future uncertainty. Today this is one of the major shortfalls in our approach and methodology. Scenarios is a vehicle for dealing with uncertainty, which has its limitations and pitfalls – as I



have tried to explain. But it is not the only tool we have, and we should develop supplementary techniques to make our approach more robust.

Second, we need to find a way to make sure that the analysts are sufficiently involved in the creative aspects of scenario development, both in the formal process and – if necessary – in complementary scenario – oriented work of our own. With all means available we must avoid being left in a situation where scenarios are forced on us through a process to which we are totally alien. If the word scenario gets to be monopolized by others, we can find a new name. What matters is that as an integral part of our analytical work we maintain the necessary room for thinking about the future and specifically pinning down what major uncertainties we are faced with.

Third, we must make a whole-hearted effort to improve our knowledge and methodology for estimating - or guessing if you will – scenario probabilities, and using such probabilities in a stringent and consistent way in our force analyses. Various techniques for weighting and optimisation should be explored. The complexity of the problem is, however, so large that we could easily lose track of what we are doing. So there is a high premium on keeping the approach simple and transparent. This is easier said than done. But I am convinced that we have a very significant potential for improvement over today's practise, which hardly goes beyond using a few predictive scenarios as yardsticks for force effectiveness.

And last, but not least, we must explore new analytical techniques for dealing with uncertainty, some of which should preferably be unconventional and predominantly qualitative. One interesting avenue is to further exploit the potential of sensitivity analysis in systematic search for the most robust force structure among the once which we find acceptable or even good. We know that optimisation is really not "the name of our game". We should pay more attention to the robustness of our alternative, good solutions across the whole range of uncertainties. Still we will need to be specific about future uncertainties, but that is possible without taking on the full task of writing scenarios. We can do our sensitivity analyses parametrically and use various expert judgement techniques to establish our best knowledge of the range of uncertainty of individual key parameters and the linkage between them.



Another way of doing robustness analysis without using full fledged scenarios goes through a definition of future tasks. Analysis of alternative force structures would give us a performance versus task profile for each of them. Then we could use available expert judgement to define a standard performance – task profile, an acceptable range of deviations from this standard, and then assign robustness values for actual deviations – positive or negative - within this range for each task. Using some sort of weighting function across all tasks, we could arrive at a measure of robustness for each force structure.

I could go on naming many other scenario-independent techniques which might be worth exploring, but I will leave that to those of you in the audience who find it interesting and worth while to pursue. A common criticism against most of these analytical approaches is that they are too much infiltrated by and dependent on subjective expert judgement. I don't have time to elaborate on this critical question now. Let me just remind you that developing future scenarios also is a highly judgemental and subjective undertaking. So we have to find out what kind of subjective judgement we are best at.

## **5 SUMMING UP**

In brief summary; This paper has outlined some rather negative lines of development that we can observe in our analytical use of scenarios. These trends need to be reversed, and the analytical community has a key role to play in that process. Using scenarios is about dealing with uncertainty in our analysis, and this is one of the most challenging aspects of military OA in general and force structure analysis in particular. This is an important area of improvement for us – to put it mildly. We should not accept to be left out of the formal scenario development process. We should resist the trend toward war more formalism and rigidity in this process. And last, but not least, we should take upon ourselves to develop a suite of supplementary, less scenario dependent analytical approaches.

One final word, which I think reflects my basic personal attitude towards operational analysis. I have always claimed that good OA must be a combination of science and art. Imagination, openmindedness, and an artist's desire to create something new are very important qualities. Scenarios used in a flexible and creative way is one of our key tools as OA artists. Let us make sure we keep full control of this tool and continue to exploit its full potential.

