



A Process for Deterring and Influencing Actors in Space

v1.01

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A Process for Deterring & Influencing Actors in Space

1 Background

1.1 Space provides nations with critical and unique capabilities that enable agriculture, support disaster relief efforts, assist in resource prospecting, and the abilities of terrestrial war-fighters. National reliance on space makes it a tempting target for adversaries, who may wish to negate economic or security advantages in other domains by disrupting space-enabled systems. Unfortunately, defending and protecting assets deployed in space is both difficult and expensive and consequently spacecraft are vulnerable to attack.

1.2 As an environment space is sensitive to disruption. Human activities in space generate pollution. Examples include:

- clouds of debris from a kinetic anti-satellite missile;
- decommissioned spacecraft;
- items lost during missions; and
- expended rocket boosters.

Pollution in space is a cause of significant concern since it is persistent and difficult and expensive to clean up.

1.3 These issues are compounded by the fact that the capacity of space is finite. There is limited availability of useful orbits and consequently, they are congested. Actors could simply place sufficient debris into orbits to deny their use. Worse still, it is estimated that the density of debris has reached levels where the presence of more debris could result in a chain reaction of collisions, each generating more debris and rendering orbits unusable. A chain reaction of collisions occurring in low earth orbit is also likely to deny access to space as spacecraft would not be able to transit to higher orbits safely.

1.4 The combination of national dependencies on space, the cost and difficulty of protecting assets in orbit, and the environment's fragility, mean that it may be necessary to act proactively in order to protect access to space. There are potentially a number of regulatory or financial solutions to managing actor behaviour in space, for example, fines or a tax on use. However, in the absence of such mechanisms, nations will need to consider how best to deter actors from courses of action that either intentionally or unintentionally have an undesirable impact on space. Actors in space must be motivated to pursue alternatives that do not disrupt or threaten access to space.

2 Aim & Linkages

2.1 Aim

2.1.1 This document identifies how to manage the behaviour of actors who threaten access or use of space. The document outlines the basic concepts and terms in use (Section 3), the assumptions and scope of this document (Section 4) and provides a simple process for deterring and influencing in space (Part I). The process is designed to be integrated with existing procedures and processes, incorporating identified best practice with an aim of avoiding or reducing many of the causes of failure. Additionally, to support planning, a part of the document is dedicated to the psychology of decision making (Part II). The aim of the document is to provide a process that increases the likelihood that actors will behave in an intended manner.

2.2 Linkages

2.2.1 Although this document is complete without reference to additional material, significant background work was undertaken before it was written. A more detailed discussion of the relationships between coercion, compellence, and deterrence, and the psychology of decision making can be found in the supporting product “The Deterrence Primer” (Grewal & Purton, 2011).

3 Basic Concepts

3.1 When a threat is used to change a chosen course of action then this is known as deterrence. Deterring someone might be achieved through dissuading them from acting at all or persuading them to change a course of action already underway. In either case, actors must be convinced that if they do not modify their behaviour then the reaction will be bad enough that it would reduce the benefit of choosing the course of action. If the reaction is chosen carefully then deterrence should prevent the action and therefore avoid escalation. Deterrence relies on having the capability to deliver the proposed reaction.

3.2 Deterrence is different from defeat. Defeat eliminates someone’s ability to select a course of action, usually by removing their capacity to choose and imposing another. Equally, deterring and defeating differ from persuasion, in which actors are influenced by modifying their fundamental beliefs or values.

3.3 When considering reactions to deter actors, there is an assumption of a punitive strategy. However, modifying actors’ behaviours does not have to depend only on a capacity to impose punishment. For example, preventing actors from obtaining any benefit from their chosen course of action is an alternative, which is known as ‘deterrence by denial’. When attempting to influence an actor, the goal is to modify actors’ perceptions of the benefits and

costs of the course of action selected. Logically, while modification can be achieved by proposing counter-action, it should include also the use of incentives as well as increasing actors' perception of the benefits of restraint.

4 Assumptions and Scope

4.1 Actors in Space

4.1.1 In Space, the Actors are States: During the Cold War, space was identified as a sanctuary principally because the two superpowers could agree on the value of protecting the domain. Space was instrumental as a mechanism for independent verification of the opposition's nuclear weapons stockpile. Since the security landscape has now changed, incentives to cooperate in space have been reduced and its importance has become increasingly asymmetrical: space is more important to some nations than it is to their potential adversaries.

4.1.2 In space and terrestrially, global institutions that are responsible for managing behaviour are weak relative to states and mechanisms for managing behaviour require states to give their consent to act. In the future, states will remain the greatest source of activity in space and the most significant potential cause of threats. Whilst the commercial aspects of space grow rapidly, for the time being these aspects remain tied strongly to national interests.

4.1.3 In Space, Actors are Rational: The idea that actors are rational is central to many theories concerning international relations. There is an assumption that actors who are the subject of this process are rational. Given the importance of this assumption, the document returns to the topic (6.3).

4.2 Focus on the Space Element

4.2.1 A simple model of any space capability has three elements (Figure 1). There is an element on-orbit outside the Earth's atmosphere. There is an element situated on the ground, parts of which are in receipt of products from space, responsible for controlling spacecraft, or launching or recovering those parts on-orbit. And there is an element where communications travel between the space and ground elements. While an attack on any part of the system has the potential to disrupt or deny the use of space capabilities, protection of the ground element or protection from interference to communications between the ground and space elements is not addressed by this document. However, that does not exclude the communications and ground elements from consideration in the process.

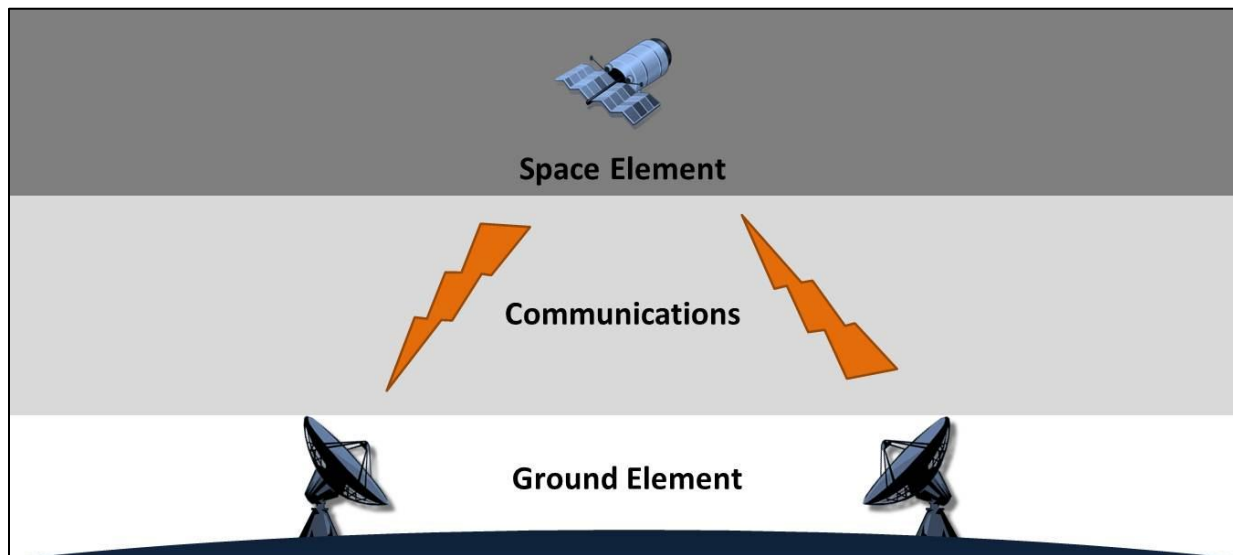


Figure 1 Space capability elements

4.2.2 Physical Characteristics of Space: There are a number of physical characteristics of space that differentiate it from the terrestrial environment: The predictability of objects in the domain given orbital mechanics; the transparency of the domain, with a lack of cover; the vulnerability of objects given constraints on system designs and the velocities involved; the persistence of pollution, especially debris and radiation; and the potential difficulty of attributing actions given the complexity of conducting a post-mortem on objects in space and the limitations of space situational awareness. It was the opinion of subject matter experts that these physical characteristics did not make it more difficult to deter actors in space than terrestrially; this does not imply that it is easy to do so in either environment.

4.2.3 Attribution in Space: Correctly attributing activities in space is known to be difficult. This document does not cover the mechanisms that are required to identify the activity or actors that is the objective of this process. There is a presumption that a potential threat has been identified and attributed correctly to an actor.

4.2.4 Hazards and Threats: As an operating environment space poses many challenges in the form of hazards and threats. Hazards to the space element include damage or destruction caused by radiation or collision with micrometeorites. A threat is considered to be different from a hazard as it requires both capability and intent. Intent indicates that the cause is human, rather than environmental. This document is concerned with threats only.

Part I: Deterring and Influencing in Space

5 Simplified Process for Deterring & Influencing in Space

5.1 Introduction

5.1.1 Figure 2 outlines a process for planners to use to deter actors in space (also see Annex Annex A). Received wisdom encourages the development of courses of action to counter an objectionable activity. This process encourages planners to consider factors that drove actors to select the objectionable course of action in the first place.

5.1.2 After identifying a threat (Step 0), the process determines factors that affect the decision making behaviour of actors (Step 1), potential alternative courses of action that may have been available to actors (Step 2), and their potential desirability (Step 3). Steps 1 to 3 predominately view the world through the eyes of the actors that are the subject of the process. Then the process considers whether it would be feasible to alter the decision making logic of these actors so that alternatives are more desirable (Step 4). And the process identifies which alternatives are attractive for the planner (Step 5).

5.1.3 Finally, the process addresses the elements of a plan that would support modifying actor behaviour (Step 6). So Steps 4 to 6 are developed from the perspective of the planner, as opposed to the actors. Each step contains directions for employment and relevant considerations from Part II. It is important to note that in application, steps in the process are likely to be used iteratively rather than in a strictly linear fashion.

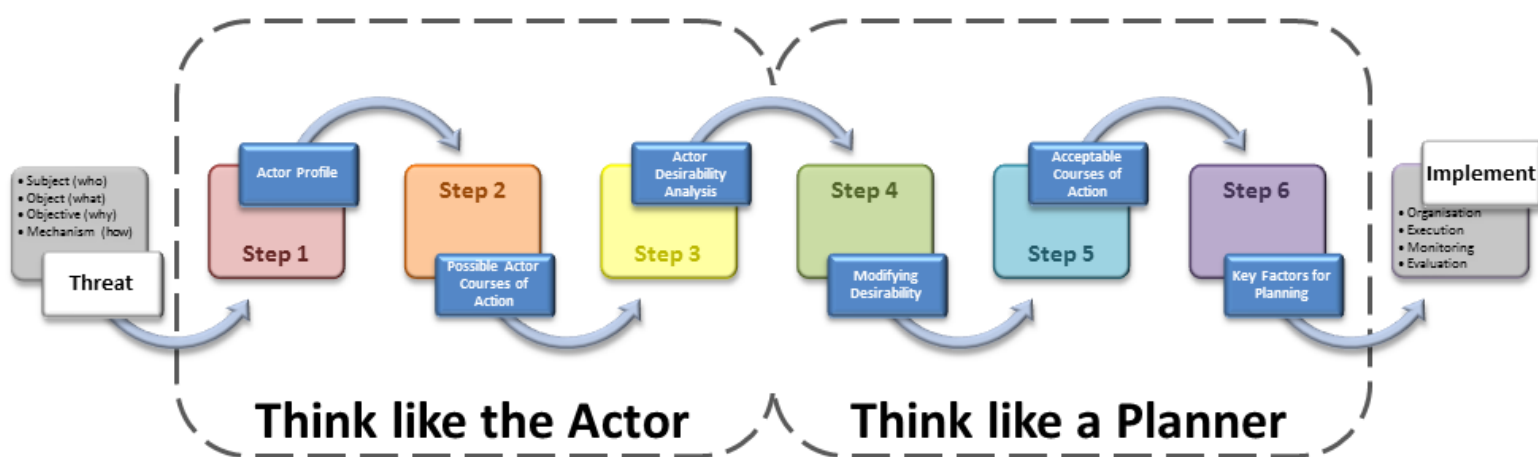


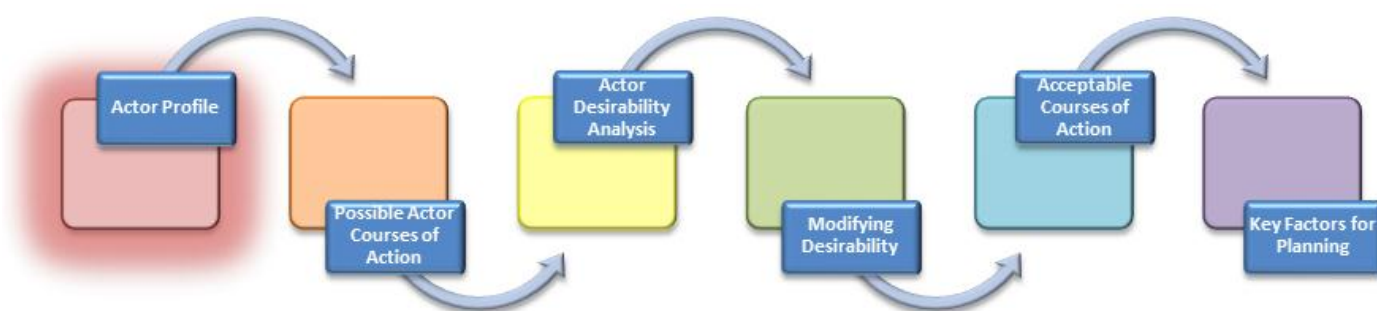
Figure 2 A Simplified Process

5.2 The Threat

5.2.1 A significant input to Step 1 is the identification of the developing situation that requires modification: the actor, who will be the subject of the process; the objective or course of action that the actor intends to pursue that is considered objectionable; the reason for the behaviour, their motivations; and the mechanisms that actors intend to use to achieve their objectives.

5.2.2 As noted in 4.2.3, there is a presumption that this process starts once a potential threat has already been identified and attributed correctly to an actor. Correctly attributing activities in space is known to be difficult and the national capabilities required to do so are often classified.

5.3 Step 1: Actor Decision Making Profile



Actor Decision Making Profile

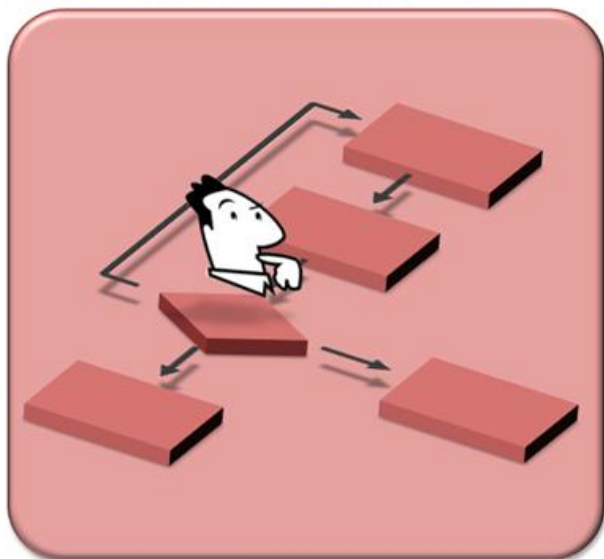


Figure 3 Process Step 1

5.3.1 Step 1 concerns the assessment of the decision making profile of the actor who is the subject of the process. It is necessary for the planner to reconstruct the decision making logic employed by the actor that resulted in the selection of the objectionable course of action, this

will require consideration of various factors motivating actors. Such factors may include how the objectionable course of action has an impact on an actor's safety or security, its esteem, or how the act supports the realisation of its potential.

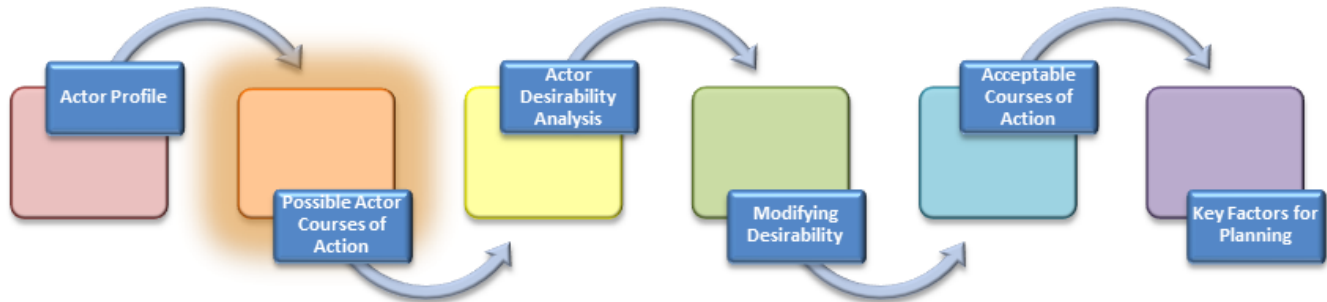
5.3.2 Here it may be useful to consider the objectionable course of action as a symptom of a more fundamental root-cause. This will help frame the objectionable activity as part of a solution to some issue the actor is trying to address. So there needs to be an assessment of actors' perceptions of their gains or losses avoided by undertaking the objectionable course of action. A poor grasp of what actors' value and how they make decisions may mean that attempts to deter or influence will fail, and this can lead to outcomes that have the opposite effects to those intended (see Part II). Evidence shows that actors believed they had little choice to act or else they would suffer some severe loss. So actor decision making is likely to be dominated by calculations concerning perceived consequences of not acting (see 6.4.5).

"To fear the crowd, yet to fear solitude; to fear being without a guard, and to fear the very men who are guarding; to be unwilling to have unarmed men about me, yet not gladly to see them armed – how could this fail to be a painful condition?"

Xenophon, *On Tyranny*

PART II CONSIDERATIONS Rational Decision Makers (6.3), Endowment Effect (6.4.2), Prospect Theory (6.4.5), Omni-balancing (6.4.6), Dominant Behaviour (6.4.9)

5.4 Step 2: Possible Actor Courses of Action



Possible Actor Courses of Action

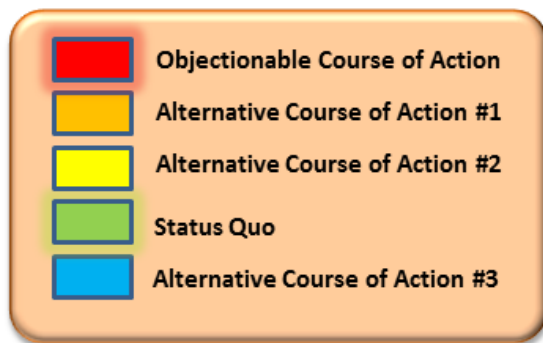


Figure 4 Process Step 2

5.4.1 Step 2 concerns the development of a list of the possible courses of action available to the actor at the time they chose the objectionable one. At this stage the minimum set to be considered is the objectionable course of action and the *status quo* (see 5.4.5). To this list must be added, if possible, alternative courses of action. And planners will need to consider whether actors' objectives might be achieved by alternatives that do not have negative consequences for space.

5.4.2 The actor may not have taken all courses of action into consideration. For example, a lack of knowledge, imagination, or time available constrains the set of courses of action. This implies that as part of the process, additional courses of action might be identified for which the actor was unaware.

5.4.3 In practice, the objective of a strategy of deterring or influencing might be employed with two distinct aims: first, to improve the security of a nation by regulating relationships with potential aggressors even though no one is considering an attack, which is sometimes called 'general deterrence'; and second, the instance where someone is considering an imminent attack while the other is planning countermeasures in order to prevent it, which is sometime called 'immediate deterrence'. This process is limited to considering emerging crises and therefore it is concerned mostly with immediate deterrence.

5.4.4 Focusing on immediate deterrence assumes that: someone is considering an objectionable action and that some counter action will take place, returning the situation to its pre-crisis condition is an acceptable outcome to the planner. Clearly, in any situation relevant to immediate deterrence, there must be some relationship between the parties in which general deterrence may have been applicable. So a focus on immediate deterrence is not intended to mean that general deterrence is not relevant to protecting space. For example, if an actor is developing a capability, coupled with military doctrine, to threaten space, then it is not necessary to wait for a crisis before considering how best to manage this issue.

5.4.5 **Perception of the *Status Quo*:** The *status quo* is a common reference point in a process of decision making, but individuals' perceptions of the *status quo* differ. For the purposes of this process the *status quo* is assumed to be the prevailing situation before the threat occurred. In general, actors will be reluctant to change the *status quo* unless it clearly leads to a loss. Actors who consider the *status quo* as unbearable are much more likely to engage in objectionable activity. Equally, if actors perceived there to be a high-cost to enduring the *status quo*, then they will distort or ignore information about the costs of challenging it. In formulating a strategy, it will be important to understand actors' perceptions of their costs or losses in relation to their understanding of the *status quo*. A long-standing *status quo* tends to acquire validity, however, actors may perceive the *status quo* in reference to a specific time or event, and therefore their interpretation of the *status quo* is not necessarily how things stand currently.

On January 11 2007, China conducted a successful test of an anti-satellite missile by destroying a Chinese weather satellite. The test produced more than two thousand pieces of debris in Low-Earth Orbit. Observers commented that the test was intended to demonstrate that China was capable of destroying American intelligence satellites in Low-Earth Orbit. From this perspective, the activity was motivated by China's need to improve its security.

The event was also the culmination of a series of tests and therefore the 2007 event might be considered also as the next logical step in maturing Chinese military technology.

PART II CONSIDERATIONS Problem Framing (6.4.3), Prospect Theory (6.4.5), Dominant Behaviour (6.4.9)

5.5 Step 3: Actor Course of Action Desirability Analysis

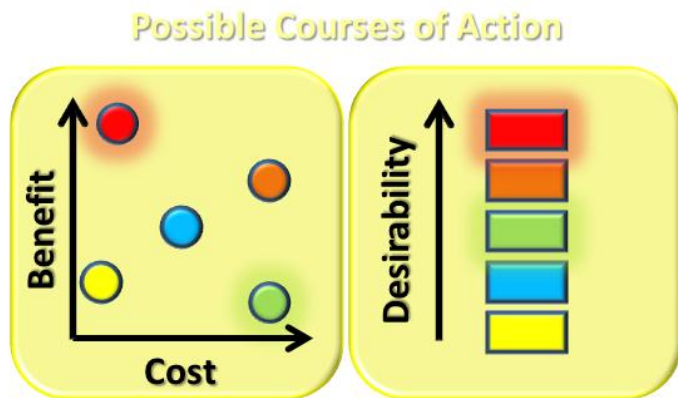
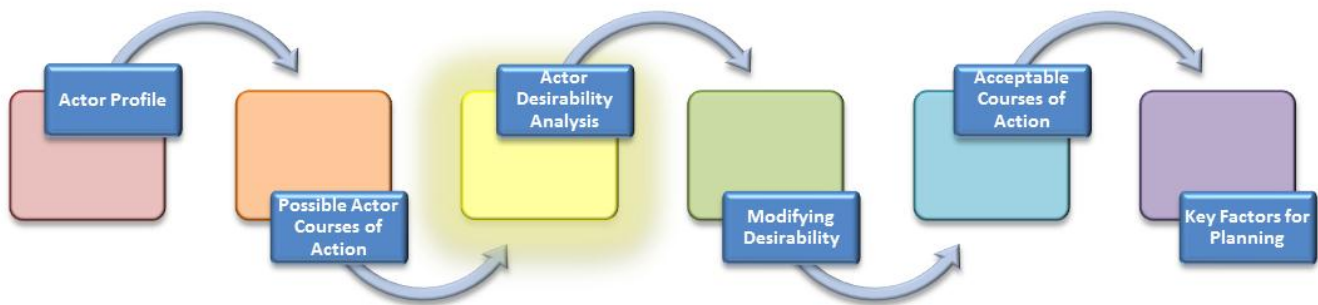


Figure 5 Process Step 3

5.5.1 Courses of action must be assessed in terms of their desirability from the perspective of the actor. It may be difficult to determine a unit of measurement to compare directly desirability across different courses of action, but an ordered ranking should be sufficient. If benefits and costs are used, the assessment should be conducted assuming that courses of action with higher benefits and lower costs were more desirable than those with lower benefits and higher costs. Part II provides details of how actors perceive the benefits and costs.

5.5.2 In order to facilitate Step 3, it will be important to develop an estimate of the desirability to the actor between courses of action. This might be achieved, for example, in Figure 6 by comparison of available options in a list according to the different levels of desirability to the actor. Figure 7 shows the assessment plotted on a chart that indicates their relative desirability on axes of benefit and cost.

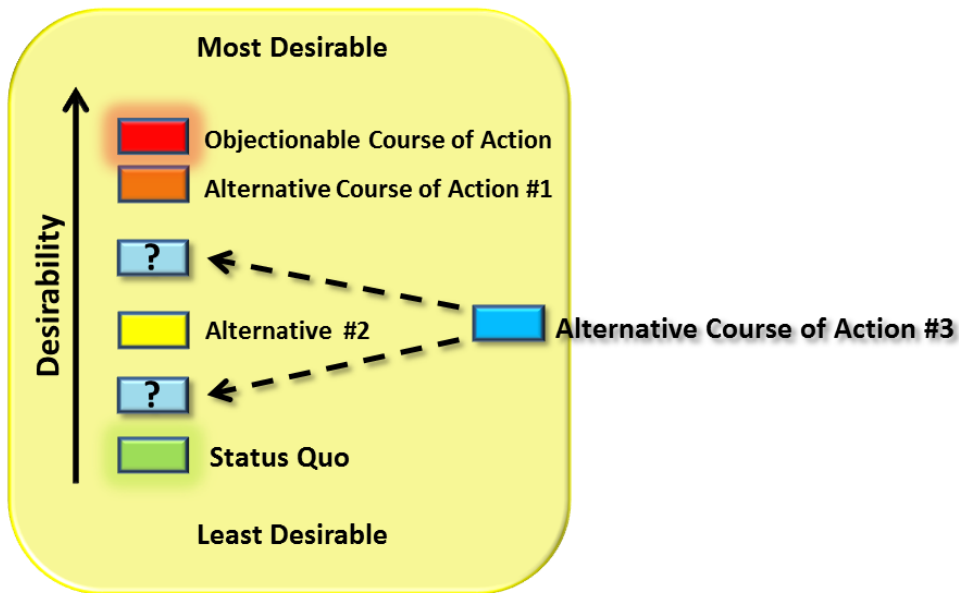


Figure 6 Step 3: Desirability List of Courses of Action

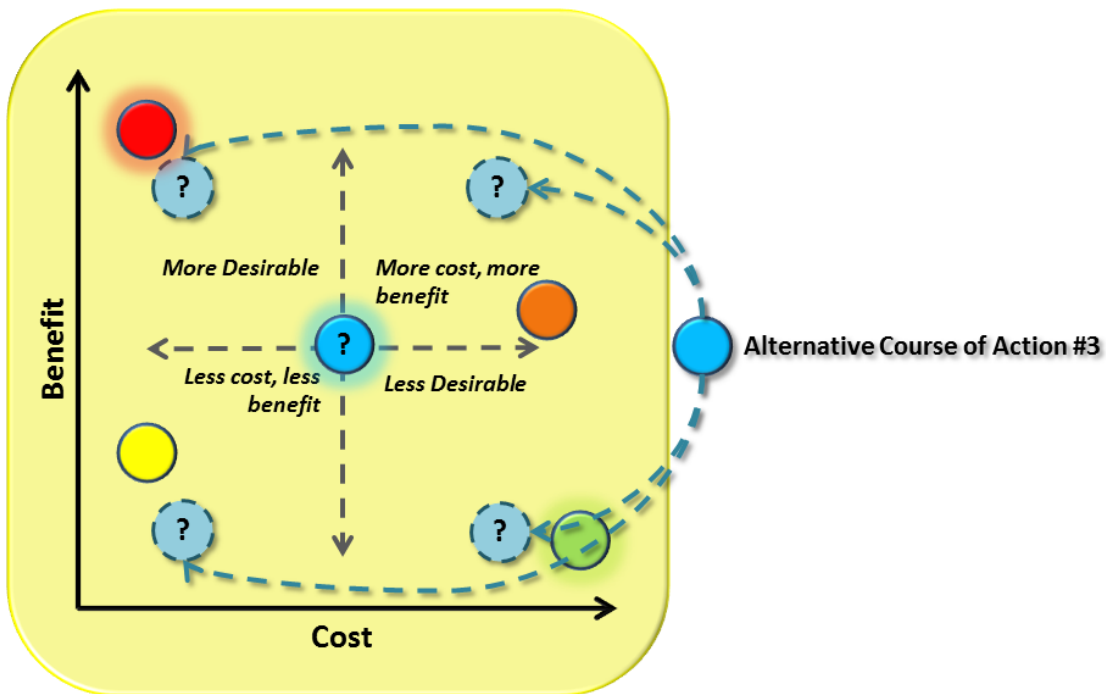


Figure 7 Step 3: Desirability on two dimensions for Courses of Action

5.5.3 When ranking different courses of action, a number of techniques are available. In addition to models and simulations, which might be available, each course of action could be scored simply as “low”, “medium”, or “high” for benefit and cost. Or a comparison of pairs of courses of action could be carried out – selecting two and comparing their desirability and then repeating until an ordered list has been developed (this is known as pairwise comparison).

5.5.4 The outcome of the assessment should result in the objectionable course of action having been identified as the most desirable from the actor’s perspective. If options exist that are assessed to be more desirable to the actor, then this difference must be addressed. The difference might result from a flawed assessment, a lack of appreciation of how the actor identified the desirability of each course of action, or from the presence of courses of action that were not considered by the actor.

5.6 **Perceived Costs of Objectionable Course of Action:** Comprehending actor decision making is likely to require framing the issue as a way of avoiding or minimising greater losses if they did not act. Actors tend to act in order to avoid loss – therefore planners can assume that the actor perceives the undesirable current situation – the *status quo* – as very expensive.

PART II CONSIDERATIONS Rational Decision Makers (6.3), Endowment Effect (6.4.2), Omni-balancing (6.4.6)

5.7 Step 4: Modifying Actor Desirability of Courses of Action

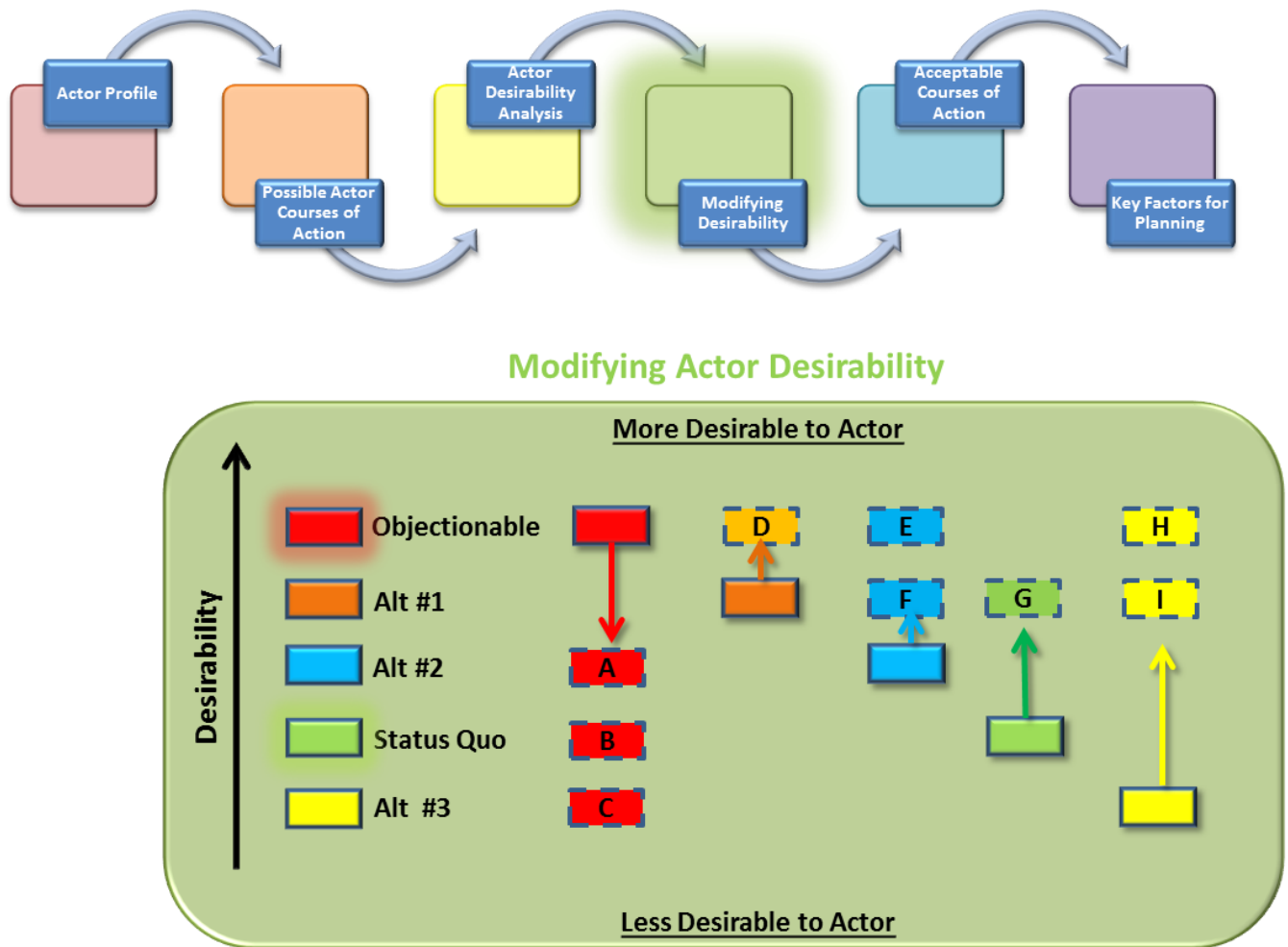


Figure 8 Process Step 4

5.7.1 This step considers how large a shift is required to replace the objectionable course of action as the first choice of actors. There are three types of courses of action: objectionable, current *status quo*, and alternatives. Alternatives are further split into courses of action that are acceptable to the planner and those that are unacceptable; this is necessary to avoid a situation where the planner deters the actor from one objectionable course of action to an alternative that may also be considered objectionable.

5.7.2 The following should be attempted:

- **Objectionable** course of action: reduce the desirability of the objectionable course of action.
- **Status Quo**: increase the desirability of the *status quo*.
- **Acceptable alternative** courses of action: increase the desirability of the acceptable alternative courses of action that are available to the actor.
- **Unacceptable alternative** courses of action: decrease the desirability of the unacceptable

alternative courses of action that are available to the actor.

5.7.3 For all acceptable alternatives, incentives should be considered in order to increase desirability. Furthermore, if it is possible to develop an assessment of the cost and benefit that the actor attributes to specific courses of action (see 6.3.4), then consider the following:

- Objectionable course of action:
 - Decrease the benefit of the objectionable course of action.
 - Increase the cost of the objectionable course of action.
- *Status Quo*:
 - Increase the benefit of the *status quo* to the actor.
 - Decrease the cost of *status quo* to the actor.
- Acceptable alternative courses of action:
 - Increase the benefit of alternative courses of action that are available to the actor.
 - Decrease the cost of alternative courses of action that are available to the actor.
- Unacceptable alternative courses of action:
 - Decrease the benefit of unacceptable alternative courses of action that are available to the actor.
 - Increase the cost of unacceptable alternative courses of action that are available to the actor.

5.7.4 As can be seen in the example in Figure 8, it is likely that there may exist a number of different choices (labelled “A” through “I”) to modify each course of action.

5.7.5 During this step, there is consideration of what leverage exists for this specific actor. Leverage might be an object that the actor values and which is vulnerable or a suitable inducement that can be offered. There is no restriction to limiting leverage to physical targeting, since the actor may not be susceptible to any physical pressure point. Consideration of leverage can be broken down into: what the actor values and whether there is the possibility to have a sufficient impact upon that object. If there is nothing that the actor values or nothing that is vulnerable, then attempts to use leverage are likely to fail.

5.7.6 **Deterrence by denial:** The primary mechanism for increasing the cost of the objectionable course of action is the sanction in the event of defiance. But “deterrence by denial” in this context focuses on identifying options that reduce benefit of the objectionable course of action. Various possibilities for deterrence by denial in space include: avoiding the threat by manoeuvring; increased protection or survivability of spacecraft; in-orbit repair or replacement; or possessing back-ups or alternative arrangements.

5.7.7 **Benefits of Incentives:** Overall, there is a tendency to focus on lawful countermeasures in deterrence; however if present undesirable situation could be improved to such an extent that changing it would not be in the actor’s interest, then incentives are another option.

5.7.8 Actor Composition: What actors' value will depend in part on their composition. For example, a neutral or allied actor may value international opinion, and therefore diplomatic efforts are likely to be an important consideration. An internationally isolated actor may hold greater value in the consolidation of their internal power, in which case influencing the actor's powerbase may be more effective.

Despite warnings from the United States, as well as China and Russia, North Korea said that it was fuelling a rocket for imminent launch into space.

"We don't really care about the opinions from the outside. This is critical in order to develop our national economy," the head of the satellite control centre told reporters who were invited to North Korea for the occasion.

The Boston Herald

5.7.9 Comparison of Military Capabilities: What matters is not raw military capability; instead it is the capability perceived to be available to be mobilized quickly in a particular situation. Historically, the short-term balance of forces has mattered more when considering success or failure to influence actors. The long-term balance of forces, which would affect the outcome of a general war, has only been associated weakly with successfully deterring actors. When actors believe that the short-term balance of forces overwhelmingly favours them then it is much more likely that they will pursue an objectionable course of action. Consequently managing the perception that actors have of the local balance of local forces will be an important consideration.

5.7.10 The Balance of Interests: It has been claimed the balance of interests is a more important predictor of crisis outcome than the balance of military power. Therefore, in addition to an assessment of military capabilities, a comparison of the parties' interests and intentions is necessary. Analysing the relationship between the perceived interests of the parties involved is critical to understanding the magnitude of actors' motivations not to comply with demands.

5.7.11 Despite the possibility of defeat or annihilation, militarily weaker actors have not always been deterred by stronger ones due to an asymmetry of interests. When the stakes are high, strategies focussing on military dominance are unlikely to succeed. A small chance of eventually prevailing will motivate weaker actors to resist if they perceive that there are no alternatives.

5.7.12 The objective of this process is that actors will abandon objectionable courses of action without any requirement for the planner to execute a plan to preserve space, but it is not a guarantee that they will. Attempts to deter or influence actors without consideration of whether or not there exist any alternatives acceptable to the actor will likely result in failure.

PART II CONSIDERATIONS Endowment Effect (6.4.2), Present-bias (6.4.4), Omni-balancing (6.4.6), Rubicon Theory (6.4.7), Organisational Model (6.5), Politics Model (6.6)

5.8 Step 5: Determining Acceptable Courses of Action

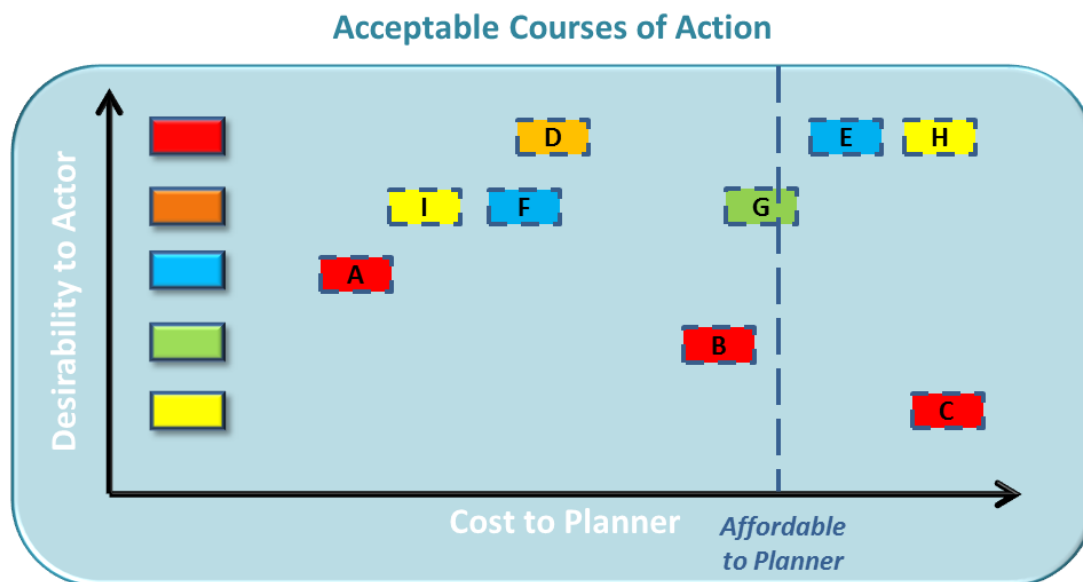
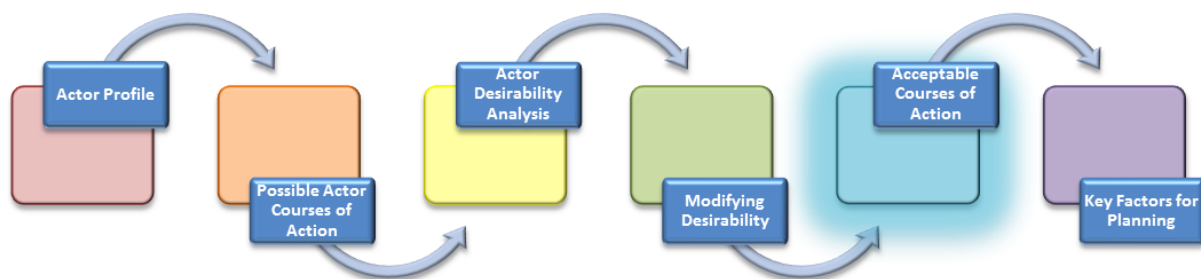


Figure 9 Process Step 5

5.8.1 Having identified a number of ways of modifying the objectionable course of action, the *status quo*, and alternatives, it is necessary to identify the cost of the modification for the planner. There are two assessments of the cost of modifying each course of action, one from the perspective of the actors (as part of Step 3 and Step 4) and one from the perspective of the planner in Step 5. When selecting, the planner must decide what they are willing to pay. This is not solely a monetary decision, there may be costs associated with relationship with allies or partners, prestige, or loss of diplomatic leverage.

5.8.2 Ultimately, success requires that there is some course of action that is mutually acceptable, even if acceptance can only be achieved through adamant interaction with the actor. Considerations must not be simply in material terms but political as well. A well-crafted plan should consider leaving actors with a face-saving option, politically as well as militarily or else it could lead to undermining of their position domestically and result in acts of self-preservation (see 4.1 and 6.4.6).

5.8.3 Given the vulnerability of the environment and national dependence on space, it is important to be cautious about adopting a reciprocal (*tit-for-tat*) strategy in space. The objective of deterring actors should be to maintain our access to space without additional harm to the domain. Therefore, an acceptable outcome, from a space perspective, might be to deflect actors from courses of action that have a negative impact on space and cause the actors to consider alternatives that are focused terrestrially.

The five days after the discovery of Soviet missiles [in Cuba] were spent canvassing possible [American] alternatives. Six major categories of action were considered: doing nothing; diplomatic pressure; a secret approach to Castro; invading; air strikes; and a blockade.

Essence of Decision: Explaining the Cuban Missile Crisis, Allison & Zelikow.

5.9 Step 6: Identify Key Factors for Planning

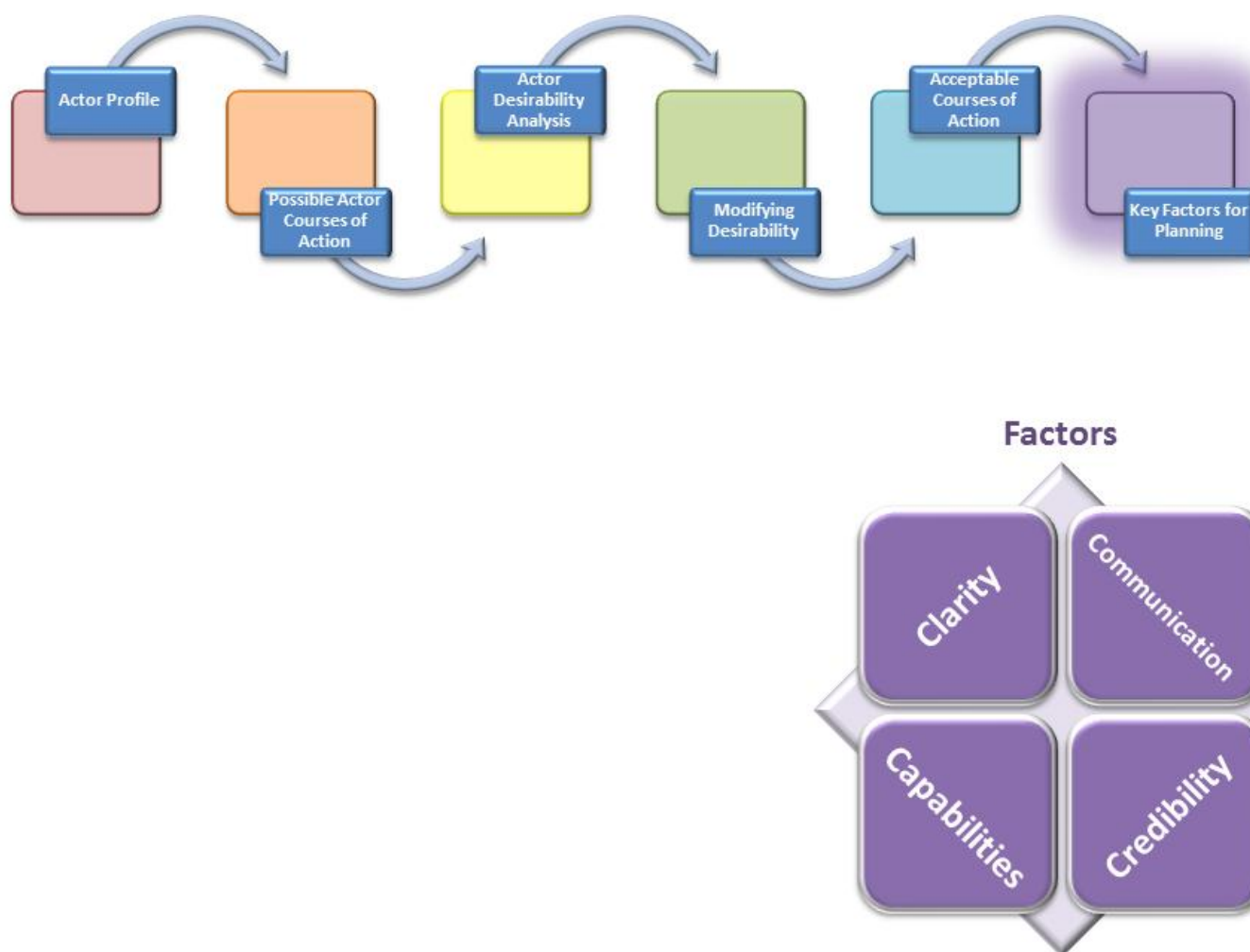


Figure 10 Process Step 6

5.9.1 The final step in the process is to identify key factors for planning. There are four key elements, which when combined contribute to success, they are: clarity, communication, capability, and credibility.

5.9.2 **Clarity:**

- What is the objectionable course of action that the planner wants to alter or stop?
- To avoid any ambiguity, has the planner stated the demand as simply as it can be?
- What will the planner's reaction be for non-compliance with the demand?
- What inducement is the planner offering in the event of compliance?

5.9.3 **Communication:**

- Have the consequences in the event of non-compliance been conveyed to the actor?
- Has the planner included a deadline?

5.9.4 **Consideration of Timing and Sequencing of Actions:** There is an identified trend in underestimating the length of time and amount of activity required to influence actors. A successful strategy must take into consideration the potential sequence of actions and reactions beyond the current horizon.

5.9.5 In addition to a demand, a deadline for a response is also required. Without deadlines, actors are free to determine their own pace of action, which may lead to outcomes undesirable to the planner. It is noted that deadline timing is crucial to success: too strict a deadline makes compliance impossible, too lenient makes compliance unnecessary. It is important to instil a sense of urgency upon actors without provoking an act intended to head-off the developing situation.

5.9.6 Whether through speeches by leaders, parliamentary statements, news reports, rumours, military deployments, alliance formations or procurement, relevant communications take place through a plethora of media. However, ill-conceived communication has the potential to compound the situation leading to escalation and a failure to deter. Whilst any plan will need to navigate a course between ambiguity and specificity, ambiguity can only work when there is uncertainty about the level of response but not when communicating a resolve to respond. Whether the message actually confers a bluff, disinformation, inflation or reality, there must be clarity about the demand and the reaction in the event of non-compliance.

5.9.7 Complexity, subtlety, and nuances inherent in most political communications may lead to failure because they increase the chance the message will not be perceived as it is intended. It can be difficult enough to communicate straightforward demands, and impossible to apply to complex, bargaining tactics, which involve detailed, difficult to understand or subtle messages. The difficulty of communicating demands is often underestimated, resulting in plans that are too intricate to communicate effectively.

5.9.8 Additionally, as pressure increases on actors, it will impede their ability to be wholly rational when making a decision between courses of action. A lack of time for decision making may reinforce erroneous assumptions, and a more limited set of courses of action will be explored.

5.9.9 **Capability:**

- What are actors' perceptions of the balance of capabilities?
- Do actors demonstrate an understanding of the planner's capabilities?

5.9.10 **Credibility:**

- What is the actor's assessment of the planner's resolve to carry out demands that the planner has made?
- Is the planner the most appropriate entity to make these demands?

5.9.11 **Perceptions of Credibility and Reputation:** Possessing a capability to act on a demand is insufficient by itself to achieve a desired change in actor behaviour. This is particularly true when actors perceive any lack of national will from the planner to carry out the demand.

5.9.12 It is important to develop a reputation for toughness with specific actors, in order to make demands more effective in future encounters. Evidence indicates a reputation for toughness with actors is not transferable to third parties. Also, one of the basic findings of cognitive psychology is perceptions change only slowly and are maintained in the face of conflicting information; this infers reputations matter in the mind of actors. First, it is necessary to maintain a reputation with actors of potential interest, which develops only over a period of time, here there is a linkage with the concept of 'general deterrence'; and second, within a coalition, separate nations are likely to have a different reputation with actors. Consequently, a coalition might seek to use the most robust reputation to influence a specific actor.

5.9.13 Excessive toughness risks engaging the reputation or prestige of actors to such an extent that they dare not back down (see 6.4.9). Also, excessive military escalation raises the possibility that war might start, or tempt actors into what they perceive as an act of pre-emptive self-preservation.

5.10 Plan Execution

5.10.1 Finally the plan needs to be executed. Although implementation of a plan is an identified requirement, it is considered to be outside the scope of this document. It is assumed that this process will inform existing crisis management or operations planning activity. However, once the plan is executed, the situation will need to be monitored and evaluated and modified using appropriate feedback if necessary.

Part II: Applying Theory in Practice

6 Introduction

6.1 Part II identifies various factors that determine how actors make decisions. A majority of Part II concerns action decision making factor, rational decision maker theory, and some modifications to the theory to make it relevant to the process. In addition to rational decision makers, there is also a short section on the possible impacts that organisations and politics have on decision making.

6.2 Actor Decision Making Factors

6.2.1 It is important that three factors are considered in the development of a successful plan:

- a. Rational decision makers;
- b. The role that organisations have in supporting decision making; and
- c. The impact of political interplay between elements within an organisation.

6.3 Rational Decision Makers

6.3.1 The idea that decision makers are rational has its roots in social science theory. Its uses are common in foreign policy analysis and development. In the context of this process, rational is different from its common usage in the English language; where rational would mean sane. Rational decision makers are assumed to rank possible courses of action by the likely benefit from selecting a course of action and its associated cost. The rational decision maker acts on those preferences, choosing the one with the highest rank from the list of possible courses of action. Within the theory, there is an understanding information might be incomplete and all possible courses of action might not have been considered by the decision maker, so bad decisions can result. But, a decision maker is said to remain rational in their approach if they choose the most desirable option from their perspective.

6.3.2 In theory, predicting a rational decision maker's preference for a course of action might be as simple as:

- Identifying possible courses of action available to the decision maker;
- Determining the benefit of choosing the course of action, from the decision maker's perspective;
- Determining the cost of choosing the course of action, from the decision maker's perspective; and
- Identifying the course of action most desirable to the decision maker, based on its cost and benefit.

6.3.3 For the process for deterring and influencing in space, the outcome of the ranking is already known; from the decision maker's perspective the most desirable is the one selected – the identified objectionable course of action. What is missing is an understanding of actors' considerations of other possible courses of action and an assessment of the benefits and costs from the actor's perspective.

6.3.4 **Benefit and Cost Considerations:** For the purposes of this process, the actor is treated as if it were an individual person with a single set of preferences, choices, and understanding of the consequences that follow from its actions. This is an acceptable, but coarse simplification (see 6.4). The consequences are really the actor's net assessment of the benefit and cost of the option – usually in terms of how the course of action satisfies its strategic goals and objectives. While the Rational Decision Maker model identifies concepts of benefit and cost it is impractical to generalise what these are without consideration of the specific actor and circumstances under which the decision is being made. An actor's assessment of their security, strength, or the environment will fundamentally affect their perceptions of benefits and costs. Therefore, it will be necessary for planners to develop an understanding of the actor benefits and costs during the process.

6.4 Modifying the Rational Decision Maker Model

6.4.1 The utility of the idea of rational decision makers is acknowledged widely because it is simple and logically appealing. However, this foundational theory has its challengers. It is presumed that the rational actor model is a useful representation of a simplified logic for decision making, but it is necessary to incorporate some additional factors that modify it.

6.4.2 **Endowment Effect:** Under a rational logic, actors' willingness to pay for something equals their willingness to accept compensation to give it up. However, the endowment effect shows that actors tend to value something more once they own it. This implies a bias in assessments of the value of things that are owned or that are perceived to be owned.

Implication: there is a tendency to underestimate the benefit of ownership or the cost actors will find acceptable in order to give up something they perceived as theirs.

6.4.3 **Problem Framing** means that identical problems can result in different choices if presented differently. In general, actors will avoid taking risks when choices are "framed" in terms of gains, whereas they will tend to take risks when those same choices are "framed" in terms of losses. **Implication:** it is important to tailor the language of the demand to leverage this preference.

Problem Framing: People show a preference for surgery with a 70% survival rate over surgery with a 30% chance of death.

6.4.4 **Present-Bias:** Actors reveal a strong tendency to make choices that are erratic over time. Actors make choices today that they would not make in the future. This happens because

the value of future rewards is discounted inconsistently. The value that actors attach to future benefits falls very rapidly for small delays and then falls much more slowly for longer ones. This is known as the "present-bias". For example, evidence shows that people tend to prefer \$100 today rather than \$120 tomorrow, but will chose \$120 in a year plus a day over \$100 in one year. **Implication:** Actors will show a preference for a reward that arrives sooner rather than later. Consequently, in decision making they are likely to discount a benefit that delivers in the longer term.

6.4.5 **Prospect Theory** shows that actors are willing to take excessive risks to avoid a loss and take fewer risks to achieve a gain. If losses are perceived to be certain, then the size of the losses involved does not need to be that large in order to encourage actors to start risk-seeking behaviour. **Implication:** rather than being a risk-seeker or risk-adverse, actors facing deteriorating situations tend to be more willing to take risky actions, when the rational choice model might predict a preference for restraint. This further underlines the importance of language, as indicated in problem framing.

6.4.6 **Omni-balancing** identifies that internal threats are perceived by actors as more important than external ones. Actors with personal security problems will discount external threats significantly. **Implication:** when considering an actors' decision making approaches it is a common mistake to underestimate the value attached to personal security in relation to threats originating internally, as opposed to external threats.

6.4.7 **Rubicon Theory** explains a difference between decision making processes before and after a course of action has been selected. Before a course of action is selected, actors tend to be deliberative, with rational calculations playing a significant part in decision-making. However, once a decision has been made, actors tend to exhibit more implementation-focused behaviour. Effort shifts to carrying out the chosen course of action. Rubicon theory proposes that once actors have selected a course of action changing that decision becomes more difficult because of the shift.

6.4.8 Implementation-focused actors are more likely to suffer from: self-serving evaluation; a poor understanding of their control of the situation; exaggerated confidence in the correctness of the course of action chosen; and a tendency to discount new information that contests the original decision. **Implication:** first, the importance of influencing actors early enough to leverage the deliberative phase; second, the perceived costs of demands made on them by planners will be discounted if actors have already reached a decision.

In 1911, when war was not yet certain, French Chief of Staff Joseph Joffre was asked if France had as good as a 70% chance of winning a war with Germany: Joffre said no. By July 1914, the French Minister for War told Joffre that France would probably have to fight. Once war was imminent and preparations were underway, Joffre more confidently predicted victory, to the extent that the Russian embassy in Paris reported the mood among the French military as "*very elated...[with]...unconcealed joy at exploiting the...favourable strategic situation*".

6.4.9 **Dominant Behaviour:** There is evidence that some actors tend to engage in displays of dominant behaviour. Dominant behaviour includes a preference to fight when challenged and obtaining satisfaction from punishing or subduing challengers. Actors showing dominant behaviour tend to prefer situations where the challenger ends up worse-off despite any personal cost. Those predisposed to dominant behaviour tend to emerge from one victory encouraged and consequently more likely to engage in another competition. Actors exhibiting dominant behaviour do not remain content with what has been gained.

6.4.10 Levels of testosterone are a key indicator of likely dominant behaviour and testosterone levels are inherited. In general, higher levels of testosterone are found among high-status males. Certain selection mechanisms operate within entities that will create elites that are composed of higher-testosterone individuals.

6.4.11 Successful dominant behaviour increases actor testosterone levels. Consequently, dominant behaviour leads to more displays of dominant behaviour. In many situations found in negotiations between nations, certain actors will have a tendency to engage in dominant behaviour. These actors will engage in the pursuit of dominance in ways that are not predicted by the rational actor model. **Implication:** in plain language, some actors, under specific conditions, like to fight. These actors will have risen to the top of certain institutions because of their dominant behaviour. Under the conditions in which this process occurs – adversarial, unstructured – these actors are less likely to act in accordance with the rational actor model.

"[President Obama]...can have a kind of an edge to his [basketball] game...if he thinks someone's been rough with him, he will retaliate...then he will start trash talking ...That's not something you see in the political sphere..."

Richard Wolfe, Former Newsweek, White House Correspondent

6.5 Organisational Model

6.5.1 The organisational model disputes the idea that state activities are simple rational choices decided upon by a single actor. It identifies, for example, that foreign policy actions are the outputs of many components within a large organization. When these outputs are combined they constitute a view, but each component works to its own patterns of behaviour. Options available to actors will be limited by organisational capacities and abilities. Furthermore that organisational action is constrained by culture, standard operating procedures, and experience of similar situations.

6.5.2 **Implication:** The organisational model suggests the existence of momentum behind organisational decisions. Also, understanding how a decision resulted from an organisation will be obscured, therefore making it more difficult to identify correctly effective mechanisms to modify behaviour.

6.6 Politics Model

6.6.1 The politics model reasons that government decisions are a result of politics, bargaining, idea-sharing, and power-playing within its structure. The model considers policy actions as outputs of a process where many individuals bring their personal desires, opinions, and viewpoints together. The politics model predicts that the agreed course of action is likely to be different from the one that the individuals would have chosen separately.

6.6.2 **Implication:** it becomes necessary to identify the games and players involved in making the decision.

6.7 Summary of Modifications to the Rational Actor Model

6.7.1 The rational actor model is a useful tool for determining the manner in which actors will select a course of action. However, some assumptions and simplifications made by the model do not fit well with reality. Generally, rather than taking risks to maximise gains or benefits, many actors take significant risks to minimise losses, and under certain conditions some actors disregard cost-benefit calculations altogether. Also, the organisation in which the decision is made can frequently amplify, frustrate, or even pervert the intentions of decision makers.

6.7.2 Incorporating factors outside of the rational actor model will help to determine better actor decision making processes. This should result in more appropriate planning.

Part III: Key Points for Planners

- ❖ It will not be a trivial task to identify the objectionable course of action in sufficient time for the process to be invoked. The absence of this stage from this process reflects only that it is not a specific consequence of space and that the problem is common to all similar planning activities.
- ❖ There needs to exist a number of supporting activities that follow the process. These activities must monitor compliance with demands and act if the demands are not met or modify activities in the event that situation changes. Equally, some mechanism must also deliver upon any inducements offered.
- ❖ When faced by an objectionable activity in space, it may be necessary to avoid a symmetrical response; otherwise there is a risk the situation will be made worse. However, deflecting actors from choosing a course that has a negative impact on space to an alternative may result in effects terrestrially; this may be the “lesser of two evils”.
- ❖ Avoid the assumption that in space, opponents can be deterred provided a well-crafted demand is made. Actors may believe the objectionable course of action is the only one available to them; in which case, demands will fail unless acceptable alternatives are identified.
- ❖ It is important to consider the context in which actors selected the objectionable course of action. It will be necessary to expend effort to identify a set of alternative courses of action available to actors, and only then, develop an appropriate response.
- ❖ Actors tend to be motivated more by avoiding or minimising loss, so understanding actors may require framing the situation in terms of the losses actors avoid by pursuing the objectionable course of action.

Annex A. Simplified Process

