



# The Application of Risk Management Methods to the Employment of Civilians in an Area of Operations

by Peter McLennan

## ABOUT THE AUTHOR

Wing Commander Peter McLennan joined the RAAF in 1980 and was commissioned as an officer in the Engineer Branch. He has served in a range of engineering and maintenance management positions in Air Force Headquarters, Headquarters Support Command, and Aircraft Depots. In his most recent staff position, he was responsible for preparedness planning in Air Force Headquarters.

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## INTRODUCTION

*... vital enabling functions are an integral part of the RAAF's war-fighting structure and are essential to the success of air operations.<sup>1</sup>*

Air Marshal L.B. Fisher

The ADF is increasingly reliant on civilian industry for the provision of various support services. Commercial support options may be loosely divided into two types: those that aim to replace Service-provided support with a commercial equivalent, and those that aim to augment or provide additional support options by facilitating the use of commercial providers without impact on the Services' force structures.

The Commercial Support Program (CSP) is a prime example of the former approach. CSP's central objective is 'to transfer support activities to the civil sector where operationally feasible, practicable and providing better value for money than the in-house [ie, ADF] provider'.<sup>2</sup> CSP grew out of the 1990 review *The Defence Force*

1 RAAF, *AAP 1000, The Air Power Manual (3rd ed)*, Air Power Studies Centre, Canberra, 1998, p. vi.

2 Department of Defence, *Commercial Support Program Manual (Version 5)*, Department of Defence, Canberra, 1997, para 2.4.

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*and the Community: A Partnership in Australia's Defence*' (the 'Wrigley Review').<sup>3</sup> Wrigley did not intend that the commercialisation program he proposed would involve relocating civilians into the Area of Operations (AO); in fact, he warned that commercialisation would limit options for deploying forces away from the coverage of Australia's civilian support infrastructure.<sup>4</sup> This was not seen to be a problem, as the prevailing strategic policy at the time strongly emphasised defeating attacks on Australia (DAA) over expeditionary operations. To ensure that the ADF retained the ability to defend Australia, Wrigley recommended a substantial increase in the size and capability of the ADF's Reserve forces ('militia'), which would have provided the ability to undertake all critical combat support functions within the military in times of crisis.

Since the Wrigley Review, the context in which commercialisation is being implemented has changed. More recent strategic policy has increased the emphasis on regional operations. Moreover, the substantial boost in Reserve forces deemed necessary by Wrigley to offset the potential operational impact of commercialisation was not achieved, while the size of the permanent forces has been further reduced with no commensurate reduction in expected capability. The effect of the variations to these two assumptions is that commercial support in the AO is now potentially much more important to the ADF than was originally foreseen. This conclusion is reflected in current strategic and industry policy.

The Defence Materiel Organisation (DMO) is working on a number of projects that aim to provide additional support options to the ADF without impacting on organic support capacity. The most relevant of these are the Deployment of Civilian Contractors (DOCC) and Military Planning and Preparedness with Contractors (MPPC) projects. These projects identify and discuss a wide range of risks associated with the deployment of contractors into an AO, noting that a 'risk' is defined to be any event that could impact on objectives.<sup>5</sup>

DOCC is primarily associated with the immediate planning process, which is conducted reactively when an operational requirement arises.<sup>6</sup> As such, DOCC can not have any direct bearing on the organic support capacity retained within the ADF.

MPPC's emphasis is on pro-active management. Accordingly, it is primarily associated with the deliberate planning process. Although the project aims to involve selected contractors in preparedness management, planning and exercises, there is no guarantee that the contractors will be involved in any actual operation. This precludes any direct impact on the Services' organic capabilities and, as with DOCC, restricts MPPC to providing options to augment ADF organic support capacity.

The Service Headquarters are aware that the issues being considered by DOCC and MPPC may also be used to rationalise the support options available to the ADF (eg, by resulting in CSP testing). This could lead to a reduction in the options retained, including the capacity for organic support.

There is a range of risks associated with relying on commercial support in the AO. These include concerns over the legality of placing civilians at risk of attack, unwillingness or inability to perform services in the AO, security problems, and so on. The increasing desirability of using contractors in the AO (such as economy and access to greater depth<sup>7</sup>) increases the likelihood that these hazards might occur. Moreover, as CSP proceeds to test functions that are ever more closely related to the delivery of combat power, the consequences of non-performance become more serious. As a result, it is becoming more important to methodically manage the risks associated with employing civilians in the AO. Risk Management (RM) is a formal framework that could be

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3 Alan K. Wrigley, *The Defence Force and the Community: A Partnership in Australia's Defence*, Australian Government Publishing Service, Canberra, 1990.

4 *Ibid.*, pp. 58-60.

5 Standards Association of Australia, *Australian Standard AS/NZS 4360:1999 Risk Management*, Standards Australia, Strathfield, 1999, p. 3.

6 This is somewhat of an over-simplification: DOCC includes the aim of preparing selected contractors for deployment should the need arise, which is a pro-active measure.

7 In this context, 'depth' refers to the more extensive range and capacity of support functions, particularly in specialised areas such as the development of advanced communications systems.

used to achieve this. RM can be used to assess the significance of the various risk factors and to guide decisions about the implementation of measures to reduce selected risks.

DOCC and MPPC do not introduce any additional risk to the ADF, since extant options for performing support are not directly under threat. For these projects, the role of RM would be limited to assisting with the selection and implementation of the best support option when required. However, commercialisation, either through CSP or as a result of extrapolating the results of MPPC, would reduce the measures available to deal with risks that arise in practice. Considering and managing the risks associated with the employment of civilians in an AO is critical in such planning, and it is desirable to employ RM principles to assist with the selection of which options to retain.

There are several processes already in use within the ADF that address the risks associated with commercialisation. The CSP process requires that a RM approach be adopted, and provides considerable guidance on how to achieve this.<sup>8</sup> However, the focus is primarily on ameliorating the risks associated with the CSP contracting process itself, rather than those associated with employing civilians in the AO. Support Command Australia also requires that RM be used to manage risk as an integral part of planning.<sup>9</sup>

This paper was written in response to a request from Air Force Headquarters. The primary aim of the paper is to develop a framework based on RM principles to assist with decisions concerning the employment of civilians in an AO. To achieve this, RM will firstly be described in general terms, and a framework for applying RM to immediate planning for the employment of civilians into an AO will be constructed. The framework will be adapted to assist with deliberate planning for the employment of civilians in an AO. Finally, comments on the circumstances that appear to involve the greatest risks will be offered.

This paper does not provide detailed descriptions of the multitude of issues that need to be assessed when considering the employment of civilians in an AO. These are already well documented elsewhere.<sup>10</sup> None of the issues is particularly complex when considered in isolation; rather, what is needed is a method to assist with the evaluation and management of the complete range of issues in a holistic manner, which is the subject of this paper.

## WHAT IS RISK MANAGEMENT?

### Comparison of Risk Management Frameworks

There are a large number of documents that describe frameworks for RM, including several ADF publications. To obtain an overview of the range of frameworks available, the following documents were studied:

- Australian/New Zealand Standard AS/NZS 4360,<sup>11</sup>
- Commercial Support Program Manual (Practice Note 14),<sup>12</sup>
- Support Command Australia Instruction ADMIN 2-4,<sup>13</sup> and
- US Army Field Manual 101-5 (Appendix J).<sup>14</sup>

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8 CSP Manual, Practice Note 14.

9 Department of Defence, *Support Command Australia Instruction Admin 02-4: Risk Management*, Support Command Australia, Melbourne, 1999, paras 2-3.

10 For example, see Department of Defence, *The Deployment of Civilian Contractors in support of Australian Defence Force Operations*, Australian Defence Force Headquarters, Canberra, 1999; and Peter McLennan, *Where Are They When You Need Them? Support Arrangement for Deployed Air Power*, Strategic and Defence Studies Centre, Australian National University, Canberra, 2001.

11 Standards Association of Australia, *Risk Management*.

12 Department of Defence, *CSP Manual*, Practice Note 14.

13 Department of Defence, *Support Command Australia Instruction Admin 02-4*.

14 US Department of Defense, xUS Army Field Manual FM-101-5.

The basic principles and processes are essentially the same across all of the alternatives; however, no two of the frameworks surveyed adopt the same terminology, or subdivide the RM process in exactly the same way. A comparison of the RM elements and steps in the four RM frameworks studied is at Annex A.

Of the frameworks evaluated, AS/NZS 4360 is the most authoritative and general. Accordingly, the terminology and processes used in this paper will generally follow those of that Standard.

## A Generic Risk Management Framework

The RM process may be broken into the following steps:

- **Step 1: Establish Context.** Consider strategic, organisational and activity-specific issues that may bear upon the organisation's attitude to risk.
- **Step 2: Identify Risks.** List the events that could result in the required level of performance not being met, and the circumstances that affect them.
- **Step 3: Analyse Risks.** The **likelihood** and **consequences** of each event should be determined (given existing measures to attempt to control risk). Consequences may be described in terms of the resources affected (eg, dollars, lives, operational impact, legality, etc) and the extent of the impact. These two elements are then combined to give a measure the **level of risk** for each event.
- **Step 4: Evaluate Risks.** Prioritise the list of events in terms of their levels of risk, and determine which events require managing (and perhaps to what degree).
- **Step 5: Treat Risks.** Identify **treatment options** for reducing the level of risk for the events selected above, by reducing likelihood and/or consequences (noting that some risks may be virtually uncontrollable). One option may be to discontinue the activity entirely. Select which treatment options to implement (perhaps on the basis of cost-effectiveness), and ensure that the **residual level of risk** (RLOR) (ie, that remaining after treatment) is acceptable. If it is not, consider additional treatment options. The acceptable level of risk should take into account the potential benefits of accepting the risk. Implement selected risk treatment options.
- **Step 6: Monitor and Review.** Watch for indications that the assumptions made in the RM process require adjusting, and update the analysis accordingly. Ensure that risk treatment is implemented and is effective.
- **Step 7: Communication and Consultation.** Communication and consultation between all affected levels of management is necessary throughout the development and implementation of the RM process.

Further details of these steps are contained in AS/NZS 4360.

## Qualitative, Semi-Quantitative and Quantitative Approaches

Step 3 requires determination of the likelihood and consequences of each risk, and the combination of these evaluations to give an indication of the resulting level of risk. These judgments can be made qualitatively, semi-quantitatively, or quantitatively (or some combination of these). These approaches are as follows:

- **Qualitative.** Likelihood is described using a set of terms such as 'rare' and 'almost certain'. Consequences are described using a set of terms such as 'insignificant' and 'catastrophic'. A table is used to assign a level of risk (such as 'high' or 'low') based on the intersection of likelihood and consequences.
- **Semi-Quantitative.** Likelihood and consequences are categorised as for qualitative analysis. A number is assigned to each category in both the likelihood and consequence sets, and the pair of numbers for each risk are combined using a formula to give a numeric value for the level of risk.
- **Quantitative.** Likelihood is usually expressed as a numeric probability, and consequences are specified in terms of the dollar cost, number of lives lost, or other measure applicable to all of the risks. These values are then mathematically combined (eg, by multiplication) to give a numeric value for the level of risk.

At present, it is unlikely that Defence could quantify the likelihood and consequences of possible future military operations, or the events that may take place within any one operation. This rules out the use of quantitative RM analysis in the short term. Moreover, the use of semi-quantitative analysis would be problematic for similar

reasons: selection of the appropriate number to assign to each category of risk and consequence effectively presupposes knowing the relative significance of the various categories. Accordingly, at this stage, the qualitative approach is the most feasible option for risk analysis for the employment of civilians into an AO. If RM proves to be a useful tool to manage these risks, and with increased maturity of the ADF's strategic and operational planning processes, it may be possible to move to semi-quantitative or quantitative analysis in future.

## Limitations of Risk Management

There are numerous difficulties in the application of RM, especially with regard to obtaining the necessary data. Methods exist for eliciting assessments when consensus among stakeholders is impossible, but failure to obtain consensus can still inhibit high level acceptance of the results of the analysis and make implementation more difficult. This problem is exacerbated by the use of a qualitative approach, since assessments must be subjective. There are substantial differences of opinion over the significance of many of the risk factors associated with the employment of civilians in an AO, and subjective RM cannot remove these. However, by requiring all parties to consider the likelihood, consequences and treatment of each of these risks, differences of opinion that arise from differing but unspecified assumptions can hopefully be exposed.

There are a few limitations associated with the nature of the standard RM framework that could restrict its application to decision making concerning the employment of civilians in an AO. RM essentially assumes that the activity being analysed must be done in the general manner specified. Treatment options do not include alternative means of performing the activity (such as using uniformed members instead of civilians), and it would not be valid to embed alternatives within the RM framework in this manner. This is because of the step-wise nature of the RM process: the alternative would only be considered if the level of risk associated with the original means of delivery were unacceptable, which effectively biases the decision-making process in favour of the initial proposal. If the aim is to evaluate alternatives free of such bias, the decision-making process must go beyond RM.

The standard RM framework is unable to assist with situations where the RLOR cannot be rendered acceptable, no matter what combination of the treatment options are selected (noting that alternative delivery methods are not valid treatment options). In this case, there is no 'exit ramp' from the process, but only a loop requiring that the analysis be repeated *ad infinitum*. The only exception is if the risk can be avoided by discontinuing the activity entirely, which will often not be feasible.

To select the best option from among a range of alternatives, each option must be evaluated independently, preferably using RM principles to deal with the risks inherent in each option. The result of each evaluation would be the effectiveness, cost and RLOR associated with each option. The preferred option would then be chosen by comparing these assessments, either on the basis of which is the cheapest option that has an acceptable effectiveness and level of risk, or which option offers the most attractive ratio of effectiveness and risk to cost. In such comparisons, care must be taken to ensure that only compatible values are compared.

A further limitation of the nature of RM concerns management of the time dimension. RM assumes that all selected treatment options must be implemented immediately to be effective, but in some circumstances (such as when considering risks that cannot occur for some years), this assumption is not valid. Adaptations need to be made to the basic RM framework to enable such situations to be considered. Since this requirement only arises in the context of deliberate planning, discussion of the required enhancements will be deferred until that section.

A final problem is that RM assumes that the risks are all essentially independent. As a result, the structure of the information used in the analysis is normally very straightforward, comprising simple lists of risks and the circumstances that may give rise to them. However, there are very complex inter-relationships between the various risks and circumstances associated with the employment of civilians in an AO. This will necessitate using more sophisticated structures to properly represent the risks and circumstances.

## APPLYING RISK MANAGEMENT TO IMMEDIATE PLANNING FOR THE EMPLOYMENT OF CIVILIANS IN THE AO

Immediate planning is conducted in response to the need to undertake a specific military operation. An example is the planning that occurred immediately prior to the ADF's operations in East Timor in 1999 to enable those operations to be undertaken. Less uncertainty is associated with immediate planning than with deliberate planning, since the general location, environment, time scale and level of threat of the operation will be known to some extent. Another simplifying factor is that immediate planning only needs to consider any other concurrent or prospective operations, as opposed to the full range of possible military scenarios, when assessing resource levels.

AS/NZS 4360 describes the management effort required to undertake RM. It would be infeasible and inappropriate to attempt to conduct a complete RM analysis of the risks associated with employing civilians in an AO within the scope of this paper. Moreover, immediate planning can only be conducted when details of the imminent military operation are reasonably well known. Accordingly, the focus of the remainder of this paper is to describe how RM could be applied to the issue in question. Lists of risks and their attributes may not be complete or applicable to every scenario, and assessments of each risk can only be discussed in general terms. However, sufficient detail will be provided to show how the relevant information can be accommodated within a RM framework, and how that framework can assist with decision-making.

### Risk Identification

There are many inter-related issues that could cause concern regarding the employment of civilians in an AO. The request that initiated this study listed 29 such issues (including headings); other issues are described in various Defence documents<sup>15</sup> and other papers.<sup>16</sup> A consolidated set of these risk factors was compiled, resulting in a list of some 75 inter-related factors. These are briefly described in Annexes B to G.

Where the risks to be dealt with are complex and inter-related, AS/NZS 4360 suggests distinguishing between the potential *sources* of risk and the areas on which they may *impact*. This approach can be usefully applied to the question of the use of civilians in an AO. When this is done, only six areas of impact are identified, which correspond to compromised operational goals or outcomes. These are listed at Table 1.

Risk	Description
Harm	Injury to civilians, damage to civilian facilities and equipment
Poor Performance <sup>a</sup>	Inadequate level of function performance (function may not be performed to the required standard, capacity and/or timeliness — or at all)
Questionable Legality	Possibly illegal actions (possible breach of international humanitarian law (IHL), OH&S, host nation law or contractual responsibility)
Excess Cost	Excess financial cost
Security Leak <sup>b</sup>	Security leak (staff deliberately or inadvertently divulge sensitive information)
Damaged Reputation	Damage to ADF or Australian reputation (eg, bad publicity, criticism by UN)

a Morale has been included as a possible source of impact on this outcome. However, morale could be considered to be an outcome in its own right, if desired. If this were done, the effect of morale on the level of performance must still be considered.

b A security leak may impact on operational performance, as may limited function performance. Therefore, at a higher level, these two risks could be combined to indicate risk to operational performance.

*Table 1: Top-level Risks*

15 Eg, Department of Defence, *Deployment of Civilian Contractors*. Even though the CSP Manual requires that a RM approach be adopted as part of the CSP contracting process, the Manual provides very few examples of the risk factors that are to be managed and the associated risk treatment options that may be considered. The emphasis is primarily on managing risks associated with the contracting process itself. The relationship between the CSP Manual requirement and the broader issue of RM of civilians in an AO is discussed on p. 28.

16 Eg, McLennan, *Where Are They When You Need Them?*

The likelihood and consequences associated with each of the six top-level risks depend on a number of contributing factors. Following AS/NZS 4360, these factors comprise sources of risk, exacerbating circumstances, or treatment measures. Diagrams for each top-level risk showing the relationships between the relevant contributing factors are at Annexes B to G. For the sake of completeness, Annex H shows the combination of the six top-level risk factors in the same format. On all of these diagrams, risk factors are represented by brief labels. Explanatory notes for each factor are provided following each diagram.

The performance of civilians in an AO may also be influenced by factors that are not included on these diagrams, such as the risk of bankruptcy. Such factors are not specifically related to employment in an AO, and are addressed by standard peacetime contracting procedures. Generally, only factors that apply specifically to the employment of civilians in an AO have been included in the diagrams.

Some factors could be absolute show-stoppers in some scenarios, but only minor inconveniences or totally irrelevant in other scenarios. Often, no one factor will totally dominate the others, which means that decisions must be based on weighing up a range of conflicting factors rather than just focussing on one single factor at a time. To support such flexible and complex decision making, it is necessary to use diagrams that support ‘shades of grey’ as opposed to the more ‘black and white’ approach to decision-making suggested by flow charts or decision trees. Accordingly, cause-and-effect (or Ishikawa) diagrams have been used to show the relationships between the various risk factors.

The key to reading cause-and-effect diagrams is to follow the direction in which each arrow *points*. The *orientation* of the arrows (eg, right-to-left, bottom-to-top) is not significant. The risk factor indicated at the tail end of the arrow contributes to the risk factor to which the arrow points. For example, in Annex B, the risk that a facility might be considered to be a legitimate military objective (‘Target’) contributes to the risk that it is ‘Likely to be targeted’ — even though the arrow points towards the left.

In addition to being able to accommodate a range of levels of risk, a further benefit of cause-and-effect diagrams is that they better reveal the hierarchical and interdependent nature of the various risk factors. This means that any one risk factor may appear multiple times on the diagrams. Linkages between the six main risks are also represented on these charts in the same manner; ie, by including references to one another (the top-level risks are shown in bold type). Some factors (eg, ‘Intelligence’ and ‘Contract’) are so ubiquitous that they have been indicated using superscripts against the factors they affect, to avoid excessive clutter. For the same reason, details of the ‘precautions’ factor have been expanded on a separate diagram (Annex B, indicated using italics).

In some cases, there are circular dependencies between risks. For example, a high risk of harm may contribute to poor performance (Annex C), and (in extreme cases) poor performance may increase the likelihood of harm (Annex B).

Risk analysis (the next step) requires assessing the level of risk for each risk factor. This must include consideration of any risk treatment measures that are already in place. Accordingly, some of the factors included in the cause-and-effect diagrams are actually treatment measures, such as the provision of shelters (Annex B) and the development of a good contract (Annex C and elsewhere). This means that some of the factors included on the diagrams actually serve to reduce the risk factor to which they are linked, which is contrary to the standard interpretation of cause-and-effect diagrams. Where such ameliorating relationships exist, a dashed line is used (which may be usefully thought of as a series of minus signs). So, while a solid line might be read as ‘contributes to’, a dashed line might be read as ‘ameliorates’.

The cause-and-effect diagrams should be considered to be suggestions only: managers may identify other factors they believe are worthy of inclusion, change the linkages between factors, or delete factors from consideration. The diagrams should be amended as experience dictates.

## **Risk Analysis**

Risk analysis involves assessing the likelihood and consequences of each risk, and then assigning an overall level of risk for each one. The cause-and-effect diagrams at Annexes B to G can be used to guide this process.

Unfortunately, it will probably be necessary to perform a separate risk analysis for every support function being considered. This is because the likelihood and consequences of some risks will vary between functions and

contractors. In addition, the benefits of accepting the risk (ie, the maximum tolerable RLOR) will depend on the criticality of the function. However, some risk factors do not depend on the function or contractor concerned, and the assessment of these factors need not be repeated.

Most of the factors included in the cause-and-effect diagrams are actually risks in their own right, inasmuch as they can be rated in terms of both likelihood and consequences (eg, 'Facility gets hit (targeted)' in Annex B). But other factors, such as 'Shelters' (Annex B), may not warrant separate assessments of both likelihood and consequences. This will often be the case when there is little uncertainty associated with the factor under consideration, so a single assessment concerning the level or extent of the factor will suffice; for example, if there is no intention to construct shelters of any kind, then a rating such as 'negligible' would suffice. This single assessment is effectively the 'level of risk' posed by the factor.

Unfortunately, some factors will need to be treated as risks in some circumstances and as single-valued levels in other circumstances. For example, if we have good intelligence on the adversary's capabilities, a direct assessment of 'weapon delivery accuracy' is possible. But if doubt exists, it may be better to make separate judgments about the likelihood and consequences of the accuracy of potential weapons, combining these to produce an assessment of the level of risk. Because of such ambiguities, it is not possible to indicate which factors should be treated as risks and which should be treated as single values. The best approach would be to attempt to consider both likelihood and consequences for each factor in the first instance, and where this proves to be invalid or unnecessary, make a direct assessment of the significance of the factor.

Most risk factors will usually be low, negligible or not applicable. The majority of the ADF's operations do not involve combat, and even where combat is required, risk can be minimised by pre-treating potential risks through such measures as ensuring contracts are adequate, personnel are trained, the Sponsored Reserve scheme is robust, and so on. This is one aim of the DOCC and MPPC Projects. Where these measures are successfully implemented, they may be considered to be preconditions rather than risks, and the corresponding factors on the cause-and-effect diagrams need not be considered further. This approach will be invaluable for contractors that can be identified well in advance of the need to involve them in operations. However, it is also likely that a range of *in situ* support services will be considered, predominantly for the provision of common infrastructure services such as catering and transportation. Often, these suppliers will only be identified after military deployment into the area has commenced; accordingly, prior 'preparation' of such contractors will not be possible, so a wider range of risks might need to be considered.<sup>17</sup>

It is important to attempt to take a broad view of the possible implications of each risk factor. The consequences of some risks may only manifest themselves at a considerable distance to the source of the risk, or may not be felt for some period of time. An example of the latter situation would be where a neglect of host nation law does not jeopardise successful completion of the operation at hand, but might be sufficiently damaging to Australia's reputation that we may be precluded from undertaking similar operations in future.

Because cause-and-effect diagrams are hierarchical, it is necessary to build up an assessment of the level of risk of the factor under consideration by considering each of the factors on which it depends. This will normally mean starting with the 'leaves' or terminal nodes on the chart; ie, those factors that have no contributing factors. Where a factor is a cross-reference from another diagram (eg, 'harm' in Annex C), the level of risk for the factor can be transcribed directly from the diagram on which it was determined (eg, 'harm' is determined at Annex B).

Once the level of risk or significance has been assessed for each of the contributing factors, it is necessary to combine these to produce an assessment of the level of risk or significance for each higher level factor. Various approaches could be taken, ranging from subjective judgment through to a numerical formulation that weighted the contributing factors appropriately. The latter approach would be extremely difficult to develop as it would need to retain great flexibility to deal with different circumstances, and would be quite contentious. Moreover, a

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17 Such host nation support was widely used during the Gulf War, to the extent that the senior logistician in the theatre concluded that '... in most future conflicts, the first job of the logistician will be to "capture" the host-nation infrastructure' (William G. Pagonis and J.L. Cruikshank, *Moving Mountains: Lessons in Leadership and Logistics from the Gulf War*, Harvard Business School Press, Boston, 1992, p. 208).

laboured approach would not be compatible with the need for expedience in immediate planning for operations. Therefore, a subjective approach to combining risk factors is recommended.

The simplest approach to combining risk factors is to select the highest level risk factor from among the contributing factors. This will effectively propagate the highest levels of risk upwards throughout the risk hierarchy. However, subjective reductions to the level of risk will need to be made where treatment options (dashed lines on the cause-and-effect diagrams) have been implemented. In addition, there seems to be a tendency to over-estimate the risk associated with any one factor when it is considered in isolation. When the factor is reconsidered in a wider context, such as when assessing the higher level risk factors to which it contributes, it might be appropriate to ascribe a lower level of risk for the parent factor than was assigned to the worst of its children, even if no ameliorating treatment factors apply. Another temptation to inflate risk assessments when working upwards through the hierarchy is to assume a causal relationship between factors where none actually exists. For example, even though the level of threat in some areas of an AO may be high, that at point-of-entry airfields may be significantly lower.

Risk factors should be combined progressively until each of the top-level risks (Table 1) has been assessed. It will be helpful if any extremely high assessments are flagged during this process, regardless of the level at which they occur in the hierarchy.

An example of a cause-and-effect diagram (Annex B) being used to assess the level of risk for a specific support function in a specific scenario is at Annex I.

## Risk Evaluation

Risk evaluation requires prioritising the risk factors in terms of their levels of risk, and determining which ones require close management. This should flow from the risk analysis.

The hierarchical nature of the cause-and-effect diagrams can be used to guide the risk evaluation process. Any top-level risk (ie, those listed in Table 1) that has been assessed as having a level of risk that is cause for concern should be flagged as requiring additional consideration of treatment options. It would also be prudent to work backwards through the relevant cause-and-effect diagrams to determine which risk factor(s) result in the overall level of risk being high. For example, a high level of risk of ‘harm’ (Annex B) may be traced back to a high level of risk of collateral damage, which in turn arises due to close proximity to other facilities that are likely to be attacked. This kind of backtracking will help with the subsequent selection of appropriate risk treatment options.

## Risk Treatment Options

Strategies to reduce the levels of risk associated with any unacceptably high risks should be identified. Again, the cause-and-effect diagrams point the way to potential solutions, by indicating the factors that influence the risk being considered. Continuing with the example from the previous section, the risk of collateral damage (Annex B) can be reduced by making appropriate changes to any of the relevant factors that contribute to that risk and are under the ADF’s control; eg:

- take additional precautions (hardening, dispersal, redundancy, etc);
- reduce the proximity to nearby targets; and/or
- reduce the likelihood that nearby targets may be attacked (eg, by increasing the precautions taken to protect the potential target from the effects of attack).<sup>18</sup>

Of course, any options that are not shown on the diagrams may also be considered. Any strategy that reduces the likelihood of likely risks, or that reduces the consequences of risks with severe consequences, is valid.

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<sup>18</sup> If these measures were not sufficient, the ‘higher order’ risk of harm could still be reduced by applying other treatment options that influence the risk of harm, such as by providing shelters, calling out civilians in accordance with Sponsored Reserve arrangements, and so on.

Some risk treatment options involving transferring or sharing the risk with other parties. The use of contractual measures is a common way of regulating this. Doing so does not reduce the overall level of risk, but redistributes it. There is usually a side-effect associated with doing so; for example, transferring risk to a contractor is likely to increase the cost of the contract. Moreover, although the scope of this paper is on the risk faced by Defence, it is also true that dealing with Defence, and conducting business in an AO, invariably involves risk to the contractor.

Selection of treatment options should be based on cost-effectiveness, where effectiveness is assessed in terms of the extent of reduction in the level of risk that would be achieved if the treatment option were to be implemented.

Having decided on one or more treatment options to adopt, it is necessary to evaluate the RLOR. This will require repeating the risk analysis phase for all risks that are influenced by the selected treatment options, and proceeds on the assumption that the options have been implemented. If the RLOR is acceptable, the risk need not be subject to further analysis, and the selected treatment options should be implemented. Ongoing monitoring of the risk would be appropriate, to verify that the assumptions made (eg, concerning the effectiveness of the treatment options) continue to be valid.

If the RLOR is still too high, then additional treatment options should be considered. According to normal RM practice, this cycle must be repeated until the RLOR is brought down to an acceptable level. Unfortunately, this leads to an infinite loop if no combination of treatment options can be found that can influence the level of risk to the required degree (and some risks may be virtually uncontrollable).

Deciding the maximum acceptable RLOR is not easy. It is necessary to take into account the benefits of accepting the risk, which will vary across different circumstances and functions. Accordingly, decisions on acceptability should consider the following:

- What are the advantages associated with using civilians in the AO for this function/scenario (eg, expedience, economy, releasing uniformed people for other duties, access to greater industrial depth, etc)?
- What alternatives exist for the delivery of this function?
- How critical is this function; ie, how quickly and significantly would an interruption to function performance impact on operations?<sup>19</sup>
- How critical is this operation or scenario; ie, to what extent are Australia's interests served?

Where the benefits of employing civilians in the AO are marginal (eg, because cost-effective alternatives exist), there is little incentive to accept a high RLOR. Conversely, where there are no alternative means of function delivery and the function is critical to operational success, a greater RLOR should be allowed. Hence, just because a particular risk has not been, or cannot be, fully treated does not necessarily make it a 'show-stopper': RM does not mean risk avoidance, but only requires that risks be considered, treated as required, and evaluated against the benefits to be gained.

In cases where the RLOR associated with the use of civilians in an AO cannot be reduced to an acceptable level, the most obvious way to deal with the situation is to adopt an alternative strategy (hypothesis) to that being evaluated; ie, to avoid employing civilians in the AO.

## Evaluation of Alternatives

All support function delivery options have their own advantages and disadvantages (including risks). Accordingly, adopting an alternative strategy to the employment of civilians in an AO will not necessarily be any better. The only way to avoid false conclusions is to evaluate each of the alternative means of function delivery fully and select the most cost-effective option (where effectiveness takes the RLOR into account).

Alternatives to the employment of civilians in an AO include:

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<sup>19</sup> The DOCC Decision Support Tool (discussed on p. 32) emphasises this issue.

- Do not perform the function at all. This is feasible (and often desirable) for functions that can be deferred for some time without significant operational impact. Examples include the use of ration packs in lieu of providing catering facilities for fresh meals, and deferring some amount of equipment maintenance.
- Perform the function outside of the AO (possibly still by civilians). Some of the risk factors applicable to performance within an AO will still apply (such as 'surge'), but many others will not (or only to a lesser extent). In addition, a number of different factors will emerge as a consequence of needing to rely on lines of communication.<sup>20</sup>
- Perform the function within the AO using military personnel. The great majority of the risks applicable to the employment of civilians in an AO also apply to the employment of military personnel in an AO. The differences stem largely from the need to provide general protection to civilians from the dangers arising from military operations,<sup>21</sup> the more stringent command and control arrangements applicable to the ADF, and the more extensive preparations for deployment undertaken within the ADF. However, even these distinctions should be seen as 'shades of grey' rather than absolute contrasts between military and civilian personnel. For example, even though IHL does not protect military personnel from the effects of conflict, commanders have a moral and legal obligation to protect military personnel whenever possible; moreover, military personnel are relatively scarce and expensive, and operate most effectively when levels of stress and morale are properly managed. Furthermore, military personnel may still go AWOL, despite the tighter command and control arrangements. And the ADF will always carry some proportion of members who are not deployable at short notice.

## Implementation

A pragmatic consideration that must be taken into account when devising a decision support framework for immediate planning is the need for quick results. If the framework is too cumbersome, decision-makers are likely to revert to 'military judgment' alone. It is better to compromise the rigour of the framework than to effectively force people to make decisions with no guidance at all.

To some extent, this involves deconstructing some of the structure built into the framework described above. The preference of operational planners is for a simple checklist of issues to consider. The preceding work provides for a range of possibilities, ranging from just the six top-level risks through to the full list of 75 factors. What might be better would be a flexible and scalable approach, whereby the planner could selectively 'drill down' into successively greater levels of detail, akin to expanding folders within a directory tree (see Figure 1). The planner stops drilling when confident enough to make a decision or time constraints require it. This is referred to as an 'indentured list'.

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<sup>20</sup> See McLennan, *Where Are They When You Need Them?*

<sup>21</sup> International Committee of the Red Cross, *Protocols Additional to the Geneva Conventions of 12 August 1949*, International Committee of the Red Cross, Geneva, 1977, p. 36.

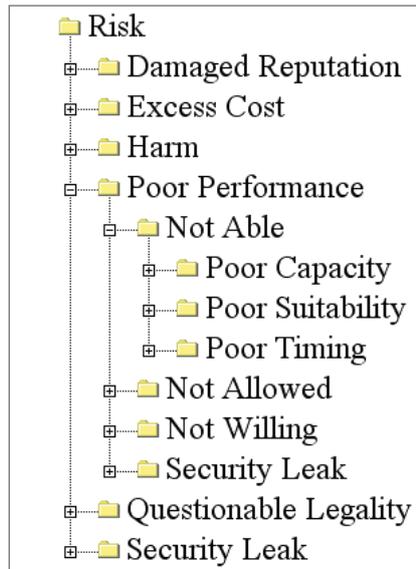


Figure 1: Scalable Risk Tree

Clearly, this approach loses a lot of the methodical detail built into the full framework. Perhaps the greatest concern is the potential for the fundamental principle of RM to be overlooked; ie, that risk is a product of likelihood and consequences. This could be addressed by adding columns to the checklist to encourage consideration of likelihood and consequences (see Table 2).

Factor	Likelihood (L)	Consequences (C)	Level of Risk <sup>a</sup> (L×C)
Risk			Low
Poor performance			Low
Not able	Low	Medium	Low
Poor capacity			
Poor suitability			
Poor timing			
Not allowed	Medium	Medium	Medium
Not willing			Low
Security leak			Low
Harm			Low

<sup>a</sup> When factors representing treatment options (such as the existence of shelters) are being considered, this column would be used to indicate the significance or effectiveness of the option in reducing risk.

Table 2: Risk Proforma (subset)

As with the use of the cause-and-effect diagrams, the analysis starts at the deepest level within the list that the planner feels confident with, and then proceeds back up the list towards the top. In the example shown in Table 2, the planner started with an assessment of the factor ‘Not able’, without attempting to first assess the factors that contribute to it (‘Poor capacity’, etc). Next, assessments were made for the other factors at the same depth (or level of indenture) within the table; ie, ‘Not allowed’, ‘Not willing’, and ‘Security leak’. Note that the factors ‘Not willing’ and ‘Security leak’ have been assessed only in terms of their level of risk, without attempting to separately assess the likelihood or consequences of these factors. The risk of ‘Poor performance’ has then been assessed, based on the assessments of all four of the factors on which it immediately depends (‘Not able’, ‘Not allowed’, ‘Not willing’, and ‘Security leak’). This process was repeated until the overall level of risk was assessed.

This example shows that the use of tables can support a flexible approach to both the level of detail and the formal analysis of factors as risks, while still making information available to planners should they want it and encouraging a holistic RM-based approach to decision-making.

## **APPLYING RISK MANAGEMENT TO DELIBERATE PLANNING FOR THE EMPLOYMENT OF CIVILIANS IN THE AO**

Deliberate planning is conducted independently of any immediate need to conduct a specific operation. It is used to forecast requirements and develop plans that might be needed if the scenario under consideration come to pass.

The basic approach to RM, decision factors and cause-and-effect diagrams suggested for immediate planning are equally applicable to deliberate planning. However, there are three aspects of deliberate planning that distinguish it from immediate planning for the purposes of applying RM:

- details of the operation or scenario under consideration are usually defined more broadly;
- more time may be available in which to treat risks or make other arrangements for the delivery of the support function under consideration; and
- deliberate planning may need to be conducted across multiple military scenarios, rather than just one imminent operation.

The implications of these differences are discussed below.

### **Broad Descriptions**

When conducting deliberate planning, details of the operation or scenario under consideration are usually defined very broadly. For example, the location of a scenario may be specified to be anywhere within the north of Australia, whereas in immediate planning, the location is usually known fairly precisely. It is necessary to adopt such broad specifications to avoid the need to conduct deliberate planning for a vast number of tightly-defined scenarios.

The practical significance of broadly defined scenario parameters means that judgments about the levels of risk to be associated with some decision factors can be made with less certainty. When faced with such uncertainty, it is tempting to make conservative assumptions and plan for the worst case. However, this is equivalent to risk aversion, and is contrary to the spirit of RM. There are various academic methods for dealing with uncertainty, but a simple approach is probably most appropriate in the first instance. The easiest method is to specify a 'best guess' value, and to flag it as being subject to uncertainty. Any factors based on such assessments should likewise be flagged as being uncertain.<sup>22</sup>

It will often be found that uncertain assessments are not as troublesome as it might appear at first, since they will often be overshadowed by other factors that are not subject to great uncertainty.

One possible outcome of an analysis of a broadly defined scenario is that the RLOR can only be rendered acceptable in certain circumstances (ie, in a subset of the circumstances covered by the scenario). Similarly, some treatment options may be deemed necessary in some circumstances and not in others. This information should be passed back to operational planners, since it affects the feasibility of conducting the intended operations in the specified manner.

### **Available Time**

Since the scenario being planned for is not imminent, more time will almost certainly be available in which to treat risks, or to make other arrangements for the delivery of the function under consideration. This is

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<sup>22</sup> A more sophisticated method is to estimate the lowest and highest plausible assessments (eg, medium to high). Such ranges are then combined when working through the cause-and-effect diagrams. This increases the complexity of the analysis, and results in a larger amount of information to assimilate.

especially the case when planning for scenarios that have inherently long warning times, such as a major attack on Australia.

Standard approaches to RM do not address the implications of the lead time required to implement treatment options. Rather, it is assumed that the risk is always present, and so all selected treatment options must be implemented immediately. Alternative planning methods, such as assumption-based planning, must therefore be used to supplement RM to better manage the time dimension.<sup>23</sup>

Treatment options take time to implement. Some options may take only a matter of hours to put into practice, such as imposing a curfew, but other options may take years, such as the construction of extensive hardened facilities. The usefulness of having a greater period of time in which to plan for possible operations is that additional treatment options may be implemented — options that may not be feasible when conducting immediate planning. MPPC is exploring some of these options, such as the involvement of contractors in planning and exercises. Other longer term measures include various precautions against attack, and efforts to ensure that foreign-owned companies are committed to supporting Australia prior to being awarded contracts.<sup>24</sup>

The availability of additional risk treatment options when conducting deliberate planning means that lower RLORs may be achieved, which in turn means that the use of civilians in an AO is more likely to be found to be feasible when conducting deliberate planning than when conducting immediate planning. This is why the pro-active approach advocated by DOCC and MPPC is most beneficial.

For scenarios with a reasonably long warning time (such as a major attack on Australia), it may be possible to defer the implementation of treatment options until relevant signposts indicate that the scenario may be becoming more likely. This means that treatment costs are not incurred immediately — and may never be incurred at all. This complicates the assessment of the cost-effectiveness of such treatment options; however, methods do exist for the costing of uncertain and future expenses. The matter of possible non-implementation may be factored in by multiplying the cost of implementation by the probability that it would actually be required (or performing an equivalent qualitative adjustment, if appropriate). Conversion of these discounted future costs into Net Present Value (NPV) terms would then permit direct comparisons of the costs of the various treatment options, and assessments of the cost-benefit of each.

## Multiple Scenarios

When deliberate planning is conducted across the whole range of authorised military scenarios (rather than for just a single imminent operation), it is possible to rationalise the overall requirements. For example, if it is necessary to retain organic capability for even a single scenario, it might be efficient to use that capability for other scenarios even though the level of risk associated with the use of civilians in these cases is low.<sup>25</sup> Conversely, if a particular function can be performed with acceptable risk by civilians in all scenarios, there is less justification for the retention of organic capability. This is why the Services are keen to ensure that a holistic approach is taken to RM; if it is not, organic capabilities may be reduced without consideration of all relevant factors, leading to inadequate support for some scenarios.

RM does not include a mechanism for evaluating multiple scenarios. The only practical approach is to evaluate scenarios one at a time using the RM approach described previously, and then to look across the results of all of the analyses. A problem with this method is the temptation to define a very large number of scenarios to analyse, but this can render the whole process infeasible. There needs to be sufficient scenarios to adequately describe

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23 For example, see James A. Dewar, Carl H. Builder, William M. Hix and Morlie H. Levin, *Assumption-Based Planning: A Planning Tool for Very Uncertain Times*, RAND, Santa Monica, California, 1993.

24 Department of Defence, *Defence and Industry Strategic Policy Statement*, Defence Publishing and Visual Communications, Canberra, 1998, pp. 33-34.

25 An argument against such rationalisation is that employing organic capabilities in benign environments for extended periods may be deskilling, given that the *raison d'être* for organic capabilities is generally to deal with higher threat situations. A counter-argument is that any operational experience may be more beneficial than the best training and exercise programs. When considering the rationalisation of support options, these issues should be evaluated on a case-by-case basis.

the entirety of the ADF's responsibilities, but not so many that the burden of analysis becomes unrealistic, nor so few that the scenario descriptions become so vague and broad that they cease to provide an adequate basis for planning.<sup>26</sup>

The need to conduct scenario-based planning is not unique to the question of the employment of civilians in AOs. The 'Composite Response Options' proposed by the ADF's Preparedness Task Force appear to provide a good basis for such planning.

Since deliberate planning should be based on authorised scenarios, long-term plans concerning the employment of civilians in AOs can be seen to be dependent upon higher level decisions, such as strategic guidance, concepts of operations, and so on. These higher level decisions influence the levels of risk of various factors by indicating the likelihood that Australia would commit forces to a particular kind of operation, specifying how that operation would be conducted (including support arrangements), and so on.

A consequence of this relationship with strategic guidance is that the attainable RLOR for the employment of civilians in an AO will depend on how closely the endorsed conflict space (ie, authorised set of scenarios) corresponds to what actually happens.<sup>27</sup> If the operations to which the ADF is committed generally fall within the scope of the authorised planning scenarios, it should not be necessary to accept a high RLOR because opportunities for pre-treating risks and arranging alternative means of service delivery should have been exploited. However, if the ADF is committed to an operation substantially outside of or larger than the expected conflict space, the likelihood of confronting untreated risks and having limited alternatives is greater, meaning that it may be necessary to accept a higher RLOR for the employment of civilians in an AO. This shows the practical importance of carefully selecting scenarios to describe the conflict space for planning purposes; in particular, if the approach taken is too optimistic, additional risk to civilians may result.

The management of concurrent operations is also included within this approach. Authorised planning guidance must include an indication about which scenarios may need to be dealt with simultaneously. This effectively defines new, composite scenarios that can be planned for normally, except that differing solutions might be appropriate for each of the concurrent operations. For example, organic support in the AO may be used for one operation, while civilian support in the AO may be used for another operation that needs to be conducted concurrently. Such a solution amounts to augmenting organic support capacity, and is valid both for concurrent operations or unexpectedly demanding scenarios.<sup>28</sup>

The need to evaluate alternative means of service delivery is especially relevant to the deliberate planning process, since it can lead to decisions regarding commercialisation. This must be combined with the need to look across multiple scenarios, which results in a substantial number of cases to be considered. Figure 2 shows how such results might be tabulated (E, R and C indicate ratings for effectiveness, RLOR and cost). Moreover, if multiple functions are being considered, each function may require a separate table of this kind.

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26 This latter problem was discussed on p. 23.

27 The term 'conflict space' is not formally defined. However, it should include dimensions corresponding to the breadth (geographical spread), depth (level of conflict), tempo (intensity) and extent of concurrency of operations.

28 A RM approach could be taken to the development of strategic guidance and the selection of authorised planning scenarios. Such an approach would expose the lower likelihood of concurrent operations. It would be reasonable to accept higher RLORs when planning for unlikely scenarios, such as worst case concurrency requirements (all else being equal).

Scenario	Delivery Option			
	Civilians in AO	Defer	Outside AO	Military in AO
<b>Scenario 1</b>	E: good R: high C: low	E: poor R: low C: medium	E: medium R: low C: medium	E: good R: medium C: medium
<b>Scenario 2</b>	E: good R: low C: low	E: good R: low C: low	E: good R: low C: medium	E: good R: low C: medium
<b>Scenario 3</b>	E: low R: high C: low	E: low R: low C: low	E: medium R: low C: high	E: medium R: medium C: high

Figure 2: Scenario/Option Matrix

There is a strong parallel between this process and cost-benefit analysis, where the competing options are traded off against one another. The main difference is that the RM-based approach deals with uncertainties, rather than guaranteed levels of performance. This is equivalent to treating ‘effectiveness’ (or ‘benefit’) as a random variable subject to a statistical distribution, instead of just a point estimate. That being the case, it might be easiest for the ADF to implement RM in this context as a refinement to the current cost-benefit approach to making decisions about alternatives.

### Risk Management within CSP

As stated earlier, the CSP process contains a valid RM system. It is therefore appropriate to consider whether the RM framework proposed by this paper for deliberate planning leading to commercialisation decisions can subsume the CSP RM system, or *vice versa*.

The RM system embedded within the CSP process necessarily assumes that the activity under consideration has already been deemed suitable for commercialisation. This is an unavoidable consequence of applying RM. Accordingly, risk treatment options such as ‘do not commercialise’ would not arise within that context. To arrive at an unbiased assessment about whether a function can be wholly commercialised requires that RM be applied to each of the alternative means of function delivery. This means that the CSP RM process alone cannot provide adequate assurance that the right decision has been made regarding commercialisation (or any of the other alternatives). It is therefore preferable to ‘wrap’ the CSP process in a higher level RM framework that is used in conjunction with deliberate planning to identify the best means of delivery of the function in question.

However, a higher level RM framework could not replace the extant CSP RM system. The latter is focused on managing the risks associated with the contracting and implementation phases of the CSP process. Where the deliberate planning RM process indicates that commercialisation is preferred, the CSP process takes over, and its embedded RM framework would be used to manage the risks identified in the higher level study as well as more specific risks associated with the contracting process. This relationship is shown in Figure 3.

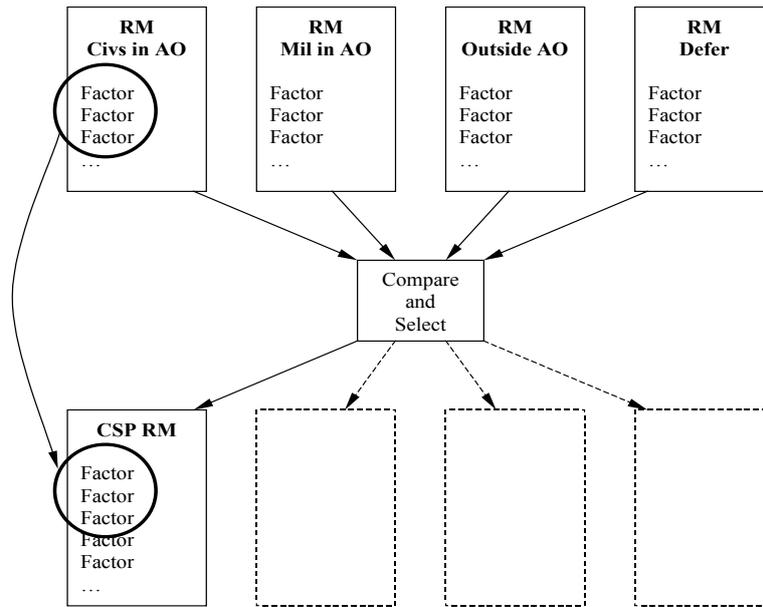


Figure 3: Relationship between Deliberate Planning and CSP RM<sup>29</sup>

## DECISION SUPPORT TOOL

The RM framework suggested in this paper could be used either in hard copy or as a computer application. Both approaches have advantages. Hard copy could be especially useful for immediate planning, since it is less daunting than a computerised tool and could be used when speed of analysis were critical. It could also be appropriate for operations where the levels of risk are slight and a detailed analysis is not justified.

However, a computer-based implementation could guide users through a potentially more detailed process. A computerised Decision Support Tool (DST) is being developed as part of the DOCC Project, and this tool is based on sound RM principles. If computer support for a holistic RM approach to decisions concerning the employment of civilians in an AO is desired, it would be prudent to consider whether this could be dovetailed into the DOCC DST rather than developing a separate application.

DMO's projects discuss the full range of risks and treatment options applicable to the deployment of civilian contractors into an AO. However, the scope of the DOCC DST is currently limited to consideration of the safety of deployed contractors used in support of ADF operations; ie, the risk of violation of IHL, which is a major element of the risk of questionable legality. Other differences in scope between this paper and the DOCC tool include the much greater detail suggested in this paper (especially to support the deliberate planning process), the inclusion of risk treatment options, and coverage of *in situ* (local infrastructure) contractors. Conversely, the DOCC DST goes beyond the content of this paper in several important areas, including the provision of guidance on support function criticality and the inclusion of a 'yellow pages' of commercial support providers.

The cascading levels of detail reflected in the cause-and-effect diagrams, in conjunction with the desirability of a flexible and scalable implementation, suggest that an interface similar to a simple kind of expert system (knowledge-based system) could be used. An example is at Annex J. In the simplest case, this dialog would seek assessments of level of risk for only the six top-level risk factors; in its most detailed form, it would seek assessments of likelihood, consequences and level of risk for each of the 75 factors (plus some duplicate references where factors appear in multiple places on the diagrams).

If the rigidity of such a dialog were considered to be too inflexible, an alternative approach would be to implement a computerised version of the augmented checklist shown at Table 2. This could possibly be done using a

<sup>29</sup> It is worth noting that RM should be used to manage the implementation of whichever option is selected, not just when CSP is chosen. Risks will exist in all cases.

sophisticated spreadsheet. Such a tool should include collapsible/expandable levels of detail (ie, subordinate risk factors) to allow tailoring of the depth of analysis, automated but over-rideable aggregation of levels of risk as contributing factors are combined, specification of either likelihood and consequences or level of risk, and automated but over-rideable determination of level of risk based on specified assessments of likelihood and consequences (where given).

## **CIRCUMSTANCES INVOLVING GREATEST RISK**

The development of a RM framework does not allow direct identification of those circumstances that involve the greatest risk. To do so would require complete implementation of the proposed framework, including the evaluation of all functions in all scenarios.

A simplistic approach would be to determine which factors are most ubiquitous in the cause-and-effect diagrams. This suggests that having a poor quality contract is the greatest risk facing the utilisation of civilians in an AO. However, while a poor contract can indeed adversely affect a multitude of outcomes, the consequences are generally not critical, and treatment measures (such as renegotiation or the provision of incentives) can usually be put in place fairly quickly. This is fortuitous, since contracts will usually not be in place with potential service providers within the local (AO) infrastructure prior to operations.

It seems likely that the most critical factors will be those associated with the level of threat posed by adversary attack (either targeted or collateral). These factors contribute directly to the top-level risk of harm, which in turn impacts on the top-level risks of poor performance and questionable legality. The consequences could be most severe, including a significant reduction of operational capability and clear violations of IHL. These risk factors cannot be directly controlled by the ADF, and the associated risk treatment measures are slow and expensive to implement and may be of limited effectiveness in extreme circumstances. However, operations involving high levels of risk in these factors are undertaken very infrequently.

The conclusion that these harm-related factors are most critical is consistent with DOCC's division of issues into 'can/can't' and 'will/won't'. The former category considers harm issues as they relate to IHL; only when these risks are deemed acceptable are other risk factors considered.

A closely related risk factor that may occur more frequently is exposure to extremely adverse or austere environmental conditions. This could also impact on operational capability, but with less severity; it is also more treatable.

In some circumstances, factors contributing to the 'not allowed' branch of the poor performance top-level risk may be significant. These include cases of foreign ownership and veto by host nation authorities.

It is difficult to identify circumstances in which other risk factors (primarily those contributing to excess cost, security leaks and damaged reputation) would be show-stoppers. Risks may be identified in these areas that are worthwhile treating, but these factors alone are not likely to result in an unacceptable RLOR necessitating alternative means of service delivery (or deferral).

Interestingly, most of the high-risk circumstances suggested above are more likely to be associated with overseas operations. Such operations may involve greater levels of threat than will probably be encountered within Australia for some time, and are more likely to be in adverse and austere environmental conditions. Problems associated with foreign ownership and veto by host nation authorities are especially applicable to overseas operations, and contractual and other legal problems are compounded by the need to deal with foreign legal systems and authorities.

## CONCLUSION

In its standard form, RM is not a sufficiently sophisticated method for assisting with many kinds of decisions associated with the employment of civilians in an AO. This is primarily due to the large number of inter-related risk factors, the need to plan for multiple scenarios, and the need to be able to evaluate alternative means of function delivery. However, the basic principles of RM are highly relevant, as they provide a rational approach to dealing with undesirable events of varying likelihood and significance.

To better address questions concerning the employment of civilians in an AO, it is necessary to tailor the basic RM method by combining it with various other management techniques, including cause-and-effect diagrams, assumption-based planning and cost-benefit analysis. Once this is done, it is possible to develop a framework to guide decision-making, which can be adapted to deal with:

- managing the risks associated with the use of civilians in an AO in a holistic manner,
- deciding which support function delivery option is best in a particular situation, and
- deciding which support function delivery options need to be retained or developed.

The basis of the decision-making framework is the arrangement of the 75 identified risks and risk treatment options into a loose hierarchy. The top-level risks are harm, poor performance, questionable legality, excess cost, security leaks, and damaged reputation.

Implementation could take many different forms. Given the inherent complexity of the domain and the difficulty in obtaining quantitative assessments, a qualitative approach is recommended, at least initially. Moreover, the differing requirements of immediate and deliberate planning suggest that the implementation needs to be quite flexible. Options include simple checklists in hard copy, cause-and-effect diagrams in hard copy, expert system, spreadsheet, or tailor-made application.

DOCC's DST currently uses a RM-based approach to assess the risk of harm. It would be possible to expand this tool to take a more holistic and detailed approach, and to include treatment options. This option should be explored prior to implementing any alternative system. Similarly, embedding RM within extant systems for the cost-benefit analysis of alternative means of delivery should also be considered. Links between these implementations and the CSP's RM system would also be beneficial, although these systems should not be totally merged.

Decisions about the employment of civilians in an AO are inextricably linked with strategic policy. In particular, deliberate planning requires the identification of a suitable range of authorised planning scenarios (including concurrency). If these scenarios are poorly chosen, additional risk to civilians may result. Moreover, the need to base force structuring decisions on the separate analysis of each scenario, support function and delivery option means that a large amount of work seems unavoidable.

The development of a decision-making framework for the employment of civilians in an AO does not allow definitive conclusions to be reached concerning the circumstances that pose the greatest risks. It seems likely that the most significant risk factors are those associated with harm from adversary attack, adverse environmental conditions, contractual problems, foreign ownership and veto by host nation authorities. These risks are more likely to occur, or be more substantial, when conducting overseas operations.

Decision-making processes based on RM can be used to manage the whole range of risks associated with the employment of civilians in an AO, and to guide decisions on which support options need to be retained or developed. Given the ever-increasing emphasis on civilian support options, such processes should be adopted. Doing so would go a long way towards ensuring the ability of the RAAF's vital enabling functions to support the delivery of aerospace power into the future.

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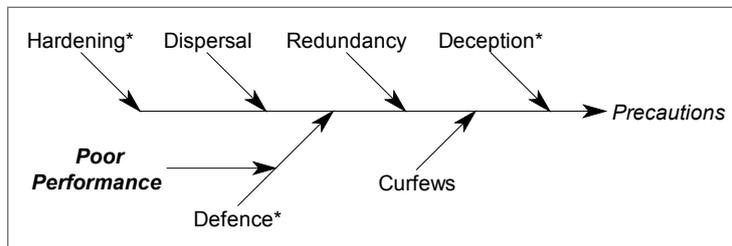
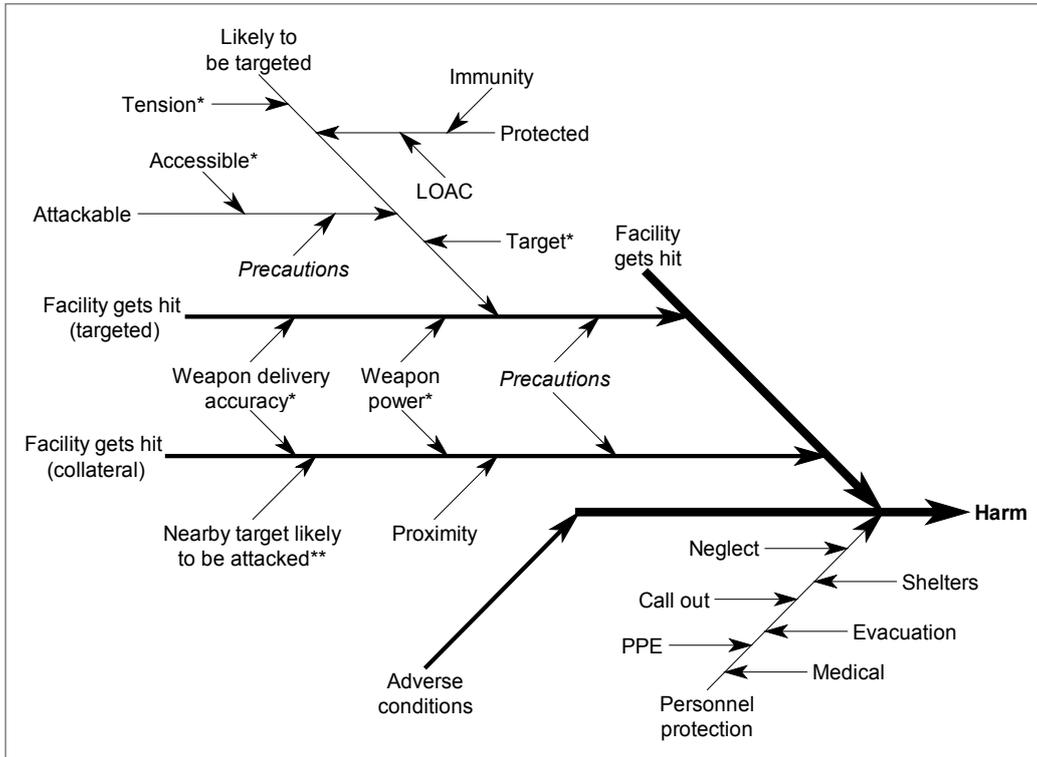
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## ANNEX A RISK MANAGEMENT TERMINOLOGY

The table below indicates differences in terminology and structure between four RM frameworks.

	AS/NZS 4360	SCI ADMIN 2-4	CSP Manual	US Army FM-101
<b>Risk Management Terminology</b>				
<b>Event</b>	Risk	Risk	Risk	Hazard
<b>Probability dimension</b>	Likelihood	Likelihood	Likelihood	Probability
<b>Seriousness dimension</b>	Consequences	Consequences	Impact	Severity
<b>Combination of dimensions</b>	Risk level	Risk rating	Risk classification, level	Risk level
<b>Remedial measures</b>	Treatment options	Treatment options	Strategies	Risk controls
<b>Risk Management Steps</b>				
<b>Background</b>	Establish context	Establish context	—	—
<b>List hazards</b>	Risk identification	Risk identification	Risk identification	Hazard identification
<b>Determine dimensions</b>	Risk analysis	Risk analysis	Risk analysis	Hazard assessment
<b>Combine dimensions</b>	“	Risk evaluation	Risk assessment	“
<b>Prioritise</b>	Risk evaluation	“	“	“
<b>Identify, select and apply remedial measures</b>	Risk treatment	Risk treatment	Risk treatment	Develop and implement controls
<b>Ongoing management</b>	Monitor and review	Monitor and review	Monitor and review	Supervise and evaluate
<b>Coordination</b>	Communication and consultation	—	—	—

## ANNEX B RISK FACTORS — HARM



### Notes

\* 'Poor Intelligence' is a contributing factor (not explicitly shown to avoid clutter).

\*\* The logic leading to 'Likely to be targeted' can be applied to nearby facilities.

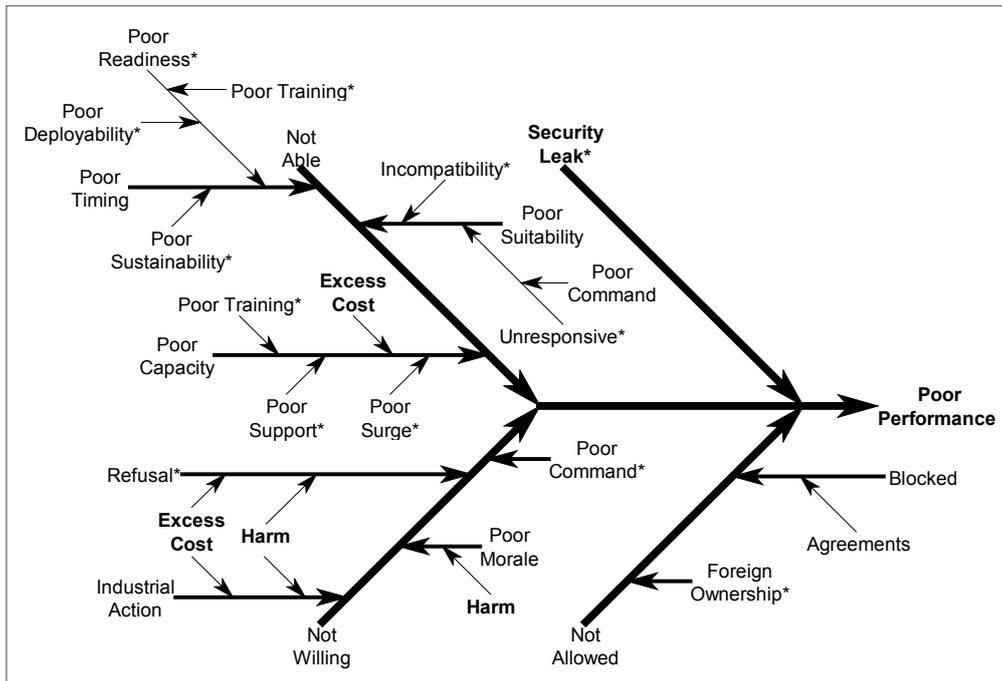
### Factors

- **Harm.** Injury to civilians, damage to civilian facilities and equipment.
- **Likely to be targeted.** Is the facility likely to be targeted for attack?
- **Tension.** What is the level of tension (likelihood and intensity of conflict) in the location? Also consider **stability** (possibility of sudden changes to level of tension).
- **Poor Intelligence.** Inaccurate intelligence on adversary's capability and intentions.
- **Immunity.** Does the function have legal immunity from attack (eg, medical, chaplaincy, and civil defence in conflict between states)?
- **Protected.** Is the function shielded from attack by legal constraints?
- **LOAC.** Is adversary willing to violate applicable Law Of Armed Conflict?
- **Accessible.** Can the adversary's weapons reach the facility or personnel?

- **Attackable.** Could the facility be attacked successfully?
- **Precautions.** What measures have been taken to reduce the likelihood of successful attack? For each contributing factor, consider effectiveness, warning, availability of backfill (if necessary), and function interruptability (where applicable).
- **Target.** Is facility a legitimate target (military objective)?
- **Facility gets hit (targeted).** The facility gets hit as a result of being targeted.
- **Weapon delivery accuracy.** How accurately can the adversary deliver its weapons on intended targets?
- **Weapon power.** What is the destructive power (spread and lethality) of the adversary's weapons?
- **Facility gets hit.** The facility gets hit, either as a result of being targeted or suffering collateral damage.
- **Facility gets hit (collateral).** The facility gets hit as a result of an attack that was targetting a different objective.
- **Nearby target likely to be attacked.** What is the likelihood that a nearby target will be attacked? (The factors contributing to 'Likely to be targeted' can be applied to nearby sites to assist with this determination.)
- **Proximity.** How close is the facility to the potential target?
- **Adverse Conditions.** Harsh environment; exposure to hazardous working conditions; austere facilities and services.
- **Personal protection.** Are personnel protected if an attack occurs?
- **Neglect.** Civilians choose to ignore protective measures.
- **Shelters.** Are adequate shelters available and usable (given likely warning time before attack and availability of backfill if needed)?
- **Call out.** Call out to Sponsored Reserve status.
- **Evacuation.** Are evacuation plans, routes and capacity sufficient (given likely warning time before attack and availability of backfill if needed)?
- **PPE.** Is Personal Protective Equipment sufficient, given the nature of the threat?
- **Hardening.** Is the facility hardened against attack?
- **Dispersal.** Is the facility geographically dispersed to reduce the ease with which it could be destroyed?
- **Redundancy.** Are there alternative means of getting the function performed?
- **Deception.** Is the facility, or the function performed within it, disguised?
- **Defence.** Are the active defence measures adequate, given the nature of the threat? Examples include air defence for air-based threats, and secure compounds, escorts or Ready Reaction Force protection for low level ground-based threats.
- **Medical.** Medical support to deal with combat and environmental injuries.
- **Poor Performance.** Inadequate level of function performance (function may not be performed to the required standard, capacity and/or timeliness — or at all).
- **Curfews.** Curfews may be used to reduce exposure to attack during especially vulnerable hours.

## ANNEX C

### RISK FACTORS — POOR PERFORMANCE



#### Notes:

\* 'Contract' is a contributing factor (not explicitly shown to avoid clutter).

#### Factors

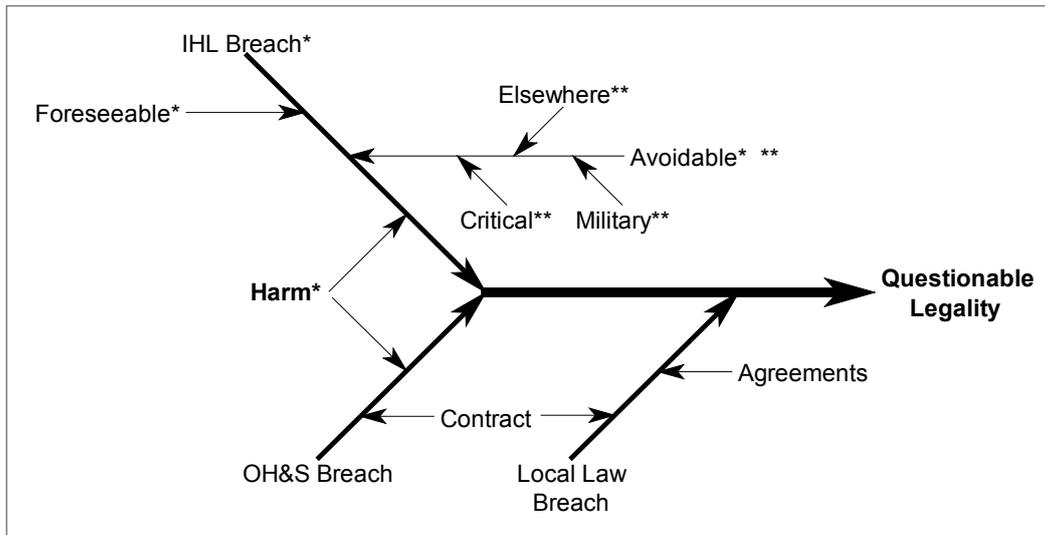
- **Poor Performance.** Inadequate level of function performance (function may not be performed to the required standard, capacity and/or timeliness — or at all).
- **Not Able.** Inability to perform the required work.
- **Poor Timing.** Inability to meet the timing demands for readiness or sustainability.
- **Poor Readiness.** Delayed deployment due to inadequate readiness (inadequate planning for contingency provisions).
- **Contract.** Inadequate contractual coverage of AO-specific issues (and contractor unwilling to agree to new terms proposed by ADF); lack of suitable incentives; poor contract management.
- **Poor Training.** Poor performance due to lack of AO-specific training (eg, self-defence).
- **Poor Deployability.** Insufficient deployable employees (eg, on medical grounds), equipment unsuitable for deployment, or contractor unable to effect deployment.
- **Poor Sustainability.** Insufficient sustainability; eg, due to inadequate personnel rotation arrangements.
- **Poor Suitability.** Civilian support is not consistent with military command and control requirements or processes.
- **Incompatibility.** Incompatibility between contractor's and ADF's deployment procedures (lack of interoperability of processes/equipment).
- **Unresponsive.** Inadequate flexibility in responding to changing operational needs (eg, due to indirect command and control, or contractual rigidity).
- **Poor Command.** Employees refuse command and control arrangements (eg, Defence Civilian, Sponsored Reserve).

- **Poor Capacity.** Insufficient capacity to meet requirements.
- **Poor Training.** Poor performance due to lack of AO-specific training (eg, self-defence).
- **Security Leak.** Security leak (staff deliberately or inadvertently divulge sensitive information).
- **Not Willing.** Contractor or employees choose not to deploy into, or remain within, the AO.
- **Excess Cost.** Excess financial cost. In particular, additional costs to the contractor and employees are incurred by operating within an AO.
- **Harm.** Injury to civilians, damage to civilian facilities and equipment.
- **Poor Support.** Reduced capacity due to contractor's inability to recruit sufficient personnel in AO; inadequate support from ADF, host nation or third country; or inadequate local infrastructure (facilities, communications, transportation, etc).
- **Poor Surge.** Insufficient surge capacity (personnel, equipment, etc).<sup>30</sup>
- **Refusal.** Employees refuse to deploy (due to level of threat, ideological disagreement, austere conditions, hostile environment, lost business, etc).
- **Industrial Action.** Trade union industrial action.
- **Poor Morale.** Poor ADF or contractor morale (eg, due to disparate standards).
- **Not Allowed.** Contractor or staff are not permitted to perform in the AO due to external constraints.
- **Blocked.** Overseas deployment blocked by foreign authority/UN (eg, inability to negotiate an appropriate Status of Forces Agreement).
- **Agreements.** Status Of Forces Agreements (etc) covering the conditions of deploying contractors overseas.
- **Foreign Ownership.** Foreign-owned company may not support operation.

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<sup>30</sup> This risk is not specifically associated with the employment of civilians in an AO (see CSP Manual, Practice Note 11).

## ANNEX D RISK FACTORS — QUESTIONABLE LEGALITY



### Notes

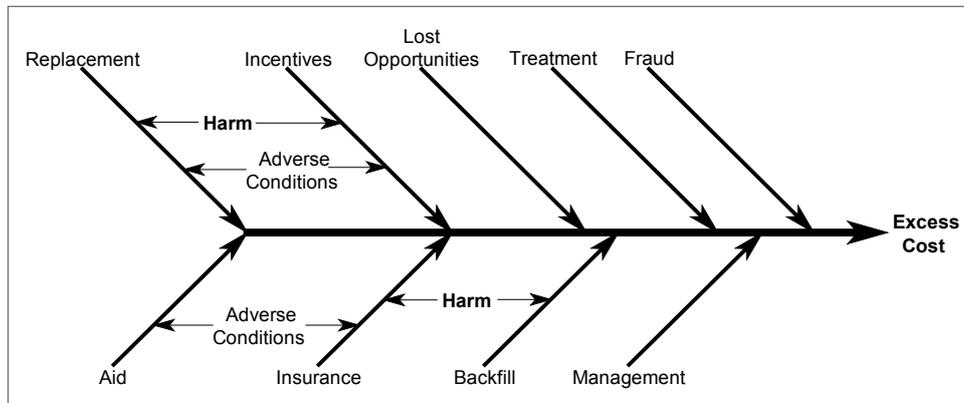
- \* All three contributing factors to 'IHL Breach' must arise before a breach results.
- \*\* Satisfying any one of the three contributing factors to 'Avoidable' is sufficient for the breach to have been avoidable.

### Factors

- **Questionable Legality.** Possibly illegal actions (possible breach of international humanitarian law (IHL), OH&S, host nation law or contractual responsibility).
- **IHL Breach.** Breach of IHL by exposing civilians to risk of injury from adversary action when avoidable.
- **Foreseeable.** Extent to which the need to place civilians at risk could have been anticipated.
- **Avoidable.** Were there options other than employing civilians in the AO?
- **Elsewhere.** Could the function have been performed somewhere safer?
- **Critical.** How essential is the function? Consider the immediacy and extent of impact on operations; hence, whether the function could have been interrupted or deferred.
- **Military.** Could military personnel have been used instead of civilians?
- **Harm.** Injury to civilians, damage to civilian facilities and equipment.
- **OH&S Breach.** Breach OH&S by not providing safe working conditions in the AO to the extent possible.
- **Contract.** Inadequate contractual coverage of AO-specific issues (and contractor unwilling to agree to new terms proposed by ADF); lack of suitable incentives; poor contract management.
- **Local Law Breach.** Deployment or utilisation or behaviour of contractors overseas contravenes host nation law, which may default to tribal law if the state has collapsed.
- **Agreements.** Status Of Forces Agreements (etc) covering the conditions of deploying contractors overseas.

## ANNEX E

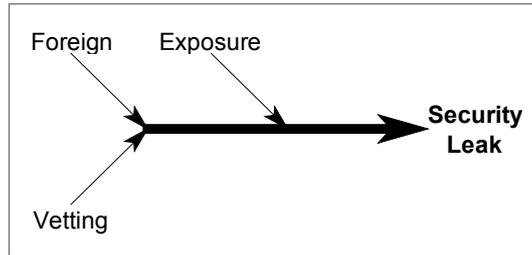
### RISK FACTORS — EXCESS COST



#### Factors

- **Excess Cost.** Excess financial cost.
- **Replacement.** Replacement of personnel; repair or replacement of equipment and facilities.
- **Harm.** Injury to civilians, damage to civilian facilities and equipment.
- **Adverse Conditions.** Harsh environment; exposure to hazardous working conditions; austere facilities and services.
- **Incentives.** Remuneration incentives to induce deployment.
- **Lost Opportunities.** Contractor loses business if unable to service other customers in parallel.
- **Treatment.** Costs associated with treatment options used to reduce other risks (eg, defence, shelters, PPE, security vetting, etc).
- **Fraud.** Exploitation of (local) monopoly status, inflated or false claims, etc.
- **Aid.** ADF support to civilians in an AO (eg, medical, comms, transport, LOC).
- **Insurance.** Insurance of contractors' employees and equipment; compensation.
- **Backfill.** May need to retain backfill capacity for periods of evacuation, sheltering, etc.
- **Management.** Contract management overheads (including in AO).

## ANNEX F RISK FACTORS — SECURITY LEAK

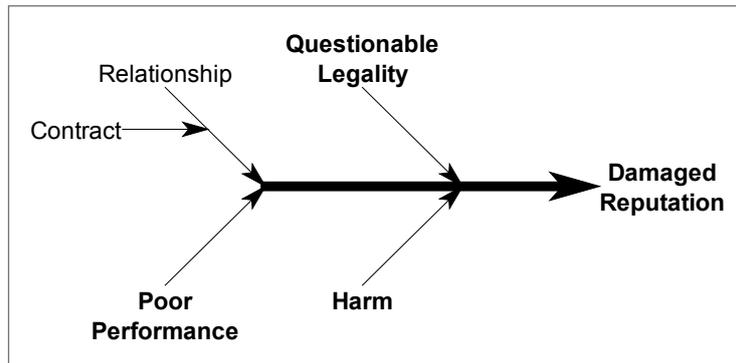


### Factors

- **Security Leak.** Security leak (staff deliberately or inadvertently divulge sensitive information).
- **Foreign.** Use of foreign nationals (eg, host nation support).
- **Exposure.** Extent of exposure to sensitive information (including via shared communications and information systems).
- **Vetting.** Adequacy of security vetting arrangements.

## ANNEX G

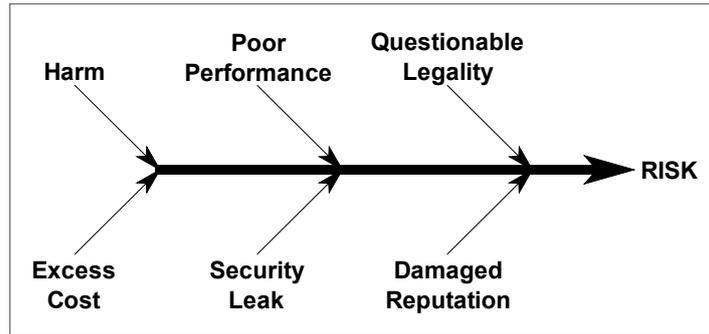
### RISK FACTORS — DAMAGED REPUTATION



#### Factors

- **Damaged Reputation.** Damage to ADF or Australian reputation (eg, bad publicity, criticism by UN).
- **Relationship.** Good ADF/contractor relationship.
- **Contract.** Inadequate contractual coverage of AO-specific issues (and contractor unwilling to agree to new terms proposed by ADF); lack of suitable incentives; poor contract management.
- **Questionable Legality.** Possibly illegal actions (possible breach of international humanitarian law (IHL), OH&S, host nation law or contractual responsibility).
- **Poor Performance.** Inadequate level of function performance (function may not be performed to the required standard, capacity and/or timeliness — or at all).
- **Harm.** Injury to civilians, damage to civilian facilities and equipment.

## ANNEX H RISK FACTORS — EMPLOYMENT OF CIVILIANS IN AN AO



### Factors

- **Harm.** Injury to civilians, damage to civilian facilities and equipment.
- **Poor Performance.** Inadequate level of function performance (function may not be performed to the required standard, capacity and/or timeliness — or at all).
- **Questionable Legality.** Possibly illegal actions (possible breach of international humanitarian law (IHL), OH&S, host nation law or contractual responsibility).
- **Excess Cost.** Excess financial cost.
- **Security Leak.** Security leak (staff deliberately or inadvertently divulge sensitive information).
- **Damaged Reputation.** Damage to ADF or Australian reputation (eg, bad publicity, criticism by UN).

## ANNEX I EXAMPLE APPLICATION OF CAUSE-AND-EFFECT DIAGRAM

Figure 4 is an example of how a cause-and-effect diagram can be used to build up an assessment of risk for one of the top-level risk factors. The diagram is based on a hypothetical proposal to utilise contractors to provide catering services on a secure compound in East Timor during Operation Stabilise (1999).

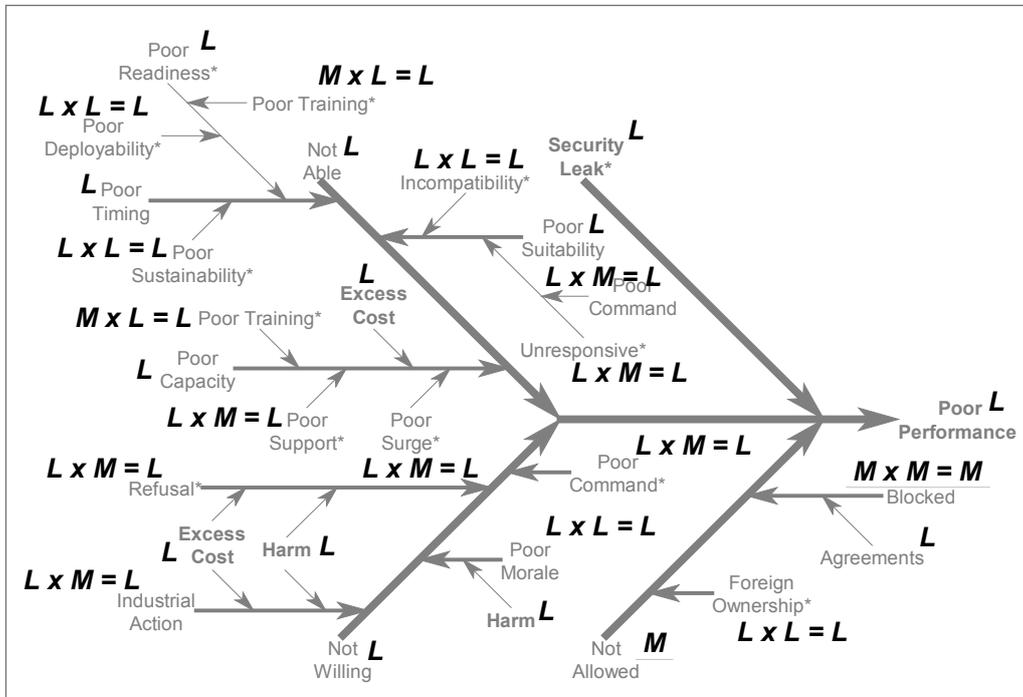


Figure 4: Example Application of Cause-and-Effect Diagram

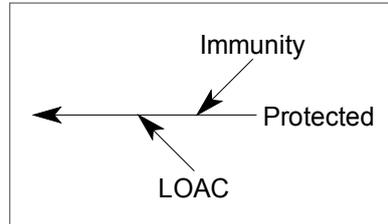
### Notes

1. Assessments of both likelihood and consequences have been made for each of the 'leaf node' (lowest level) risk factors (eg, 'L x M'). L indicates low; M indicates medium. These assessments have been combined to give an assessment of the level of risk for each of these factors (eg, '= L').
2. Separate assessments of likelihood and consequences have not been made for higher level risk factors; rather, a simple assessment of the level of risk has been made by combining those of the contributing factors.
3. Any level of risk assessments greater than low have been underlined, to help to focus subsequent risk evaluation and treatment. This is likely to lead to efforts to secure agreement to the proposal from host nation authorities, such as by negotiation of an appropriate Status Of Forces Agreement.

## ANNEX J

### DECISION SUPPORT TOOL INTERFACE

This annex shows a portion of a possible dialog between a planner and a DST. The example is based on a section of the cause-and-effect diagram at Annex **Error! Reference source not found.**; the relevant section is reproduced at Figure 5.



*Figure 5: Cause-and-effect diagram for 'Harm' (extract)*

### Notes

1. In a complete implementation, questions could be expressed in terms of level of risk in the first instance, and be broken out into separate assessments of likelihood and consequences where appropriate and as selected by the planner.
2. This question and the next one represent the next level of detail available, and would only appear if 'More' is selected to the first question.
3. This question is a repeat of the first question, but now shows how the answer can be based on the additional detail provided.
4. The default is based on a standard combination of the answers provided to the subordinate questions, but can be over-ridden if judged appropriate.
5. This dialog should be part of a loop that allows modification of the levels of risk associated with the treatment options that are embedded within the diagrams. In this way, the analysis process is repeated until an acceptable balance between risk and treatment is achieved.











