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Assessing the Risk to Deployed Personnel on Military Operations: a Discussion of Qualitative and Quantitative Approaches

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The question

How do we advise on the conditions of service (additional pay, tax concessions and leave entitlements) for personnel deployed overseas?

Previously: Deployments were deemed to be either “warlike” or “non-warlike” based on a top-down consideration of the operation

- **will force be applied?**
- **is there an expectation of casualties?**

Proposed: The Defence Operational Risk Assessment (DORA) model based on a bottom-up set of metrics

(how important is this issue for this operation? times weightings)

Question for today: how do the qualitative (top-down) and quantitative (bottom-up) approaches compare?

- **Calibration/validation**

The DORA scale

<i>Type of Operation</i>	<i>Category</i>	<i>Illustrative Examples</i>
Warlike	5	World War I & II
	4	????
Hazardous (Non-Warlike)	3	????
	2	????
	1	Border Security
Peacetime	N/A	Humanitarian Operations (i.e. Aceh earthquake/tsunami, Pakistan floods), Domestic Disaster Relief (i.e. Victorian bush fires, Queensland floods), Security Operations (i.e. Sydney Olympics)

Off-shore deployments

Op TOWER East Timor
Op RENDER SAFE South West Pacific Nations
Op SOLANIA South West Pacific
Op ANODE Solomon Islands
Op ASTUTE East Timor
Op GATEWAY S China Sea/Indian Ocean
Op PALATE II Afghanistan
Op SLIPPER Afghanistan and Middle East
Op RIVERBANK Iraq
Op PALADIN Israel/Lebanon
Op MAZURKA Sinai
Op ASLAN South Sudan
Op RESOLUTE Border Protection



The risk-based approach

Instead of a yes/no categorisation of warlike versus non-warlike we noted that there are several risks that may be present.

The DORA model is based on assessment against a set of harm factors, grouped by these headings:

- Physical risk
- Health risk
- Operational risk
- Psychological risk

We developed a previous version of this in 2004, since then we've had a lot of operations and been able to test the original method and model.

The harm factors

	<i>Risk Matrices</i>			
	Physical	Health	Operational	Psychological
<i>Harm Factors</i>	Opposing Forces	Communicable Diseases	Mission	Threat to Self
		Environmental Threats	Reliance on Allies	Exposure to Trauma
		Health Infrastructure	Operational Tempo	Operational Stressors

10 in total – when we first did this we had 15 in 3 groups

Treatment of the harm factors

1. Each of the four areas had a Subject Matter Expert (SME) assessment group
 - A previous version of the model has been used for guidance for the last 8 years – some familiarity of the concept and usage
2. Harm factors were defined by the SMEs
 - Data sheet - includes “points to consider” when looking at a particular operation
3. Weightings within the matrices (AHP)
 - Workshop of SMEs (weighted their harm factors)
4. Weightings across the matrices
 - Workshop of SMEs (weighted the risk groups)
 - SMEs couldn't weight their own risk group
5. NB consensus reached

How it works (bottom-up)

	Indicative weighting	Score for Operation EXAMPLE (out of 10)	Weighted score (out of 10)
Opposing forces	0.3	4	1.2
Communicable diseases	0.05	5	0.25
Environmental threats	0.05	6	0.3
Health infrastructure	0.05	3	0.15
Mission	0.2	5	1.0
Reliance on allies	0.1	6	0.6
Operational tempo	0.1	3	0.3
Threat to self	0.05	6	0.3
Exposure to trauma	0.05	8	0.4
Operational stressors	0.05	5	0.25
<i>totals</i>	<i>1.00</i>		<i>4.75</i>

NB the operation would be scored before deployment - threat

Initial categories

<i>Type of Operation</i>	<i>Operational Category</i>	<i>Initial Boundaries</i>
Warlike	5	8.01 - 10
	4	6.01 - 8.0
Hazardous	3	4.01 - 6.0
	2	2.01 - 4.0
	1	0 - 2.0
Peacetime	N/A	N/A

Refining the bottom-up method

- 14 past and 7 current operations
- workshop of SME to discuss and agree on a score for each operation
 - For current operations a representative from the planning groups briefed on the situation
 - SMEs from the assessment groups provided additional explanation and clarification
 - Each harm factor was scored
 - usually the assessment groups had already scored their areas before they came, but did reconsider in the light of further information eg the psychology group assessed a humanitarian operation as a high likelihood of exposure to trauma. However the workshop revealed that the personnel would be within the wire and the factor was reduced.
 - A similar process was followed for previous operations with a briefing from the Nature of Service Branch
 - At the end, the SMEs were asked to consider modifying the scores to ensure consistency
 - SMEs also had to provide a narrative comment to support the scores
- Comment on the SMEs - they were indeed SMEs as this was part of their day job

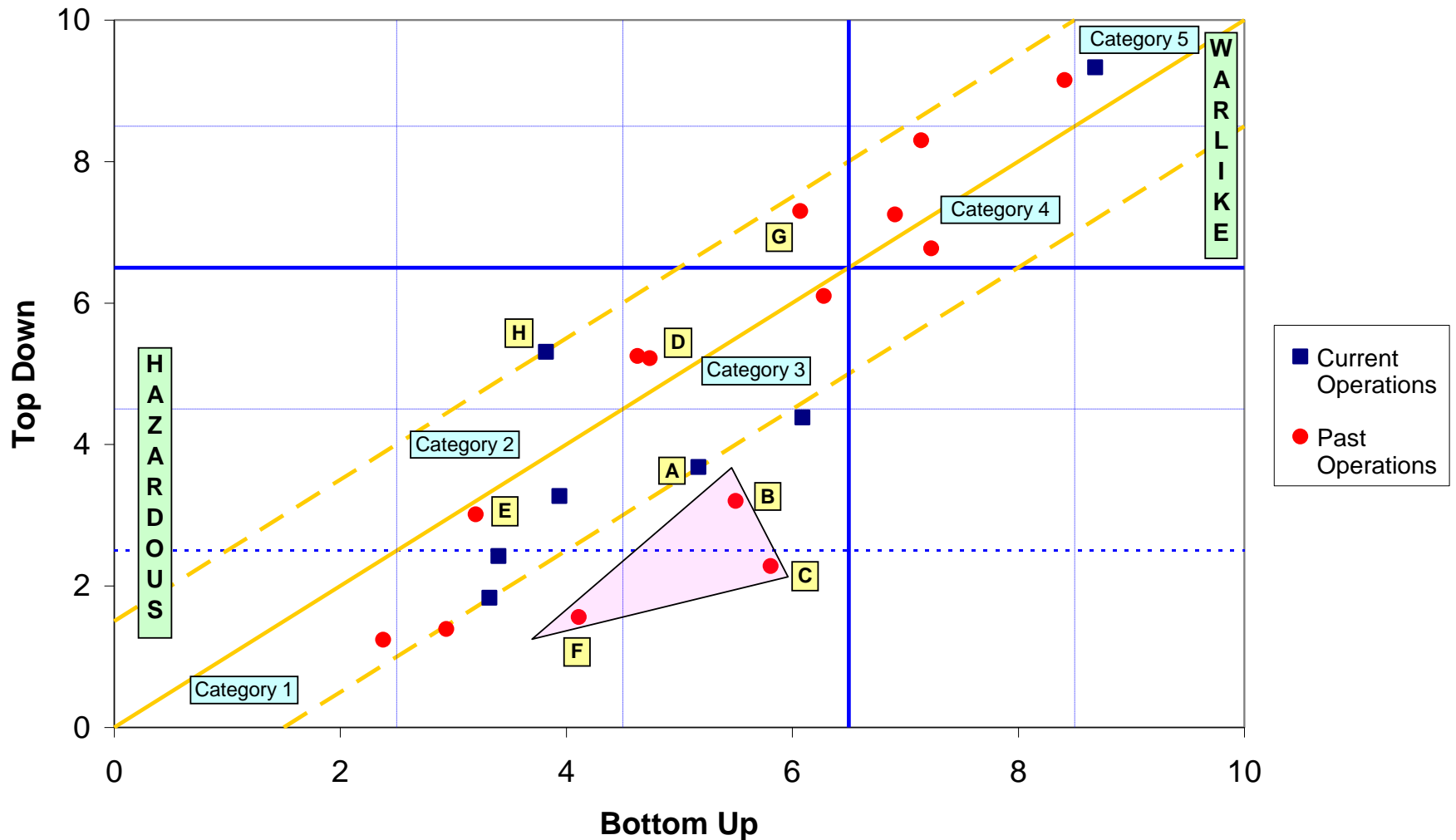
The top-down method

- A different set of SMEs were engaged
 - 20 ADF personnel (all three services)
 - >10 years service
 - At least one deployment
- They were asked to give an overview of the operation and place it in the DORA scale:
 - Split each category into high and low
 - Gives a 0-10 scale
- Again overall reconsideration for consistency was followed
- SME gave detail on how they rated the operations

- Allows comparison of the two approaches:
 - Quantitative v qualitative
 - Both scored out of ten - calibration
 - Validation
 - Identification of inconsistency

DORA scale	Score out of ten
5 High	9-10
5 Low	8-9
4 High	7-8
4 Low	6-7
3 High	5-6
3 Low	4-5
2 High	3-4
2 Low	2-3
1 High	1-2
1 Low	0-1

Comparison the two methods



Adjustments based on the comparison of the qualitative and quantitative insights

1. The boundaries of the (bottom-up) scale were adjusted marginally upwards:

- Dividing line between warlike and hazardous shifted from 6.0 to 6.5 (counters all 6s and one 7)

2. the upper limit of lowest category of hazardous was raised to 2.5:

- Stops obvious peacetime operations like supporting the Olympics creeping up the scale (scored as 1.84)

<i>Type of Operation</i>	<i>Operational Category</i>	<i>Modified Boundaries</i>
Warlike	5	8.51 - 10
	4	6.51 - 8.5
Hazardous	3	4.51 - 6.5
	2	2.51 - 4.5
	1	0 - 2.5
Peacetime	N/A	N/A

Comments on the top-down and bottom-up comparisons (1)

<i>Feature</i>	<i>Description</i>	<i>Issue</i>	<i>Implication</i>	<i>Example operations</i>
Personal experience	Scorers may have been deployed on previous phase of an operation or a similar action, or may have little exposure to the more hazardous zones	Non-typical conditions existed at the time	Top-down scoring too low	A, C
Long term operations	The operation may have run for many years with peaks and troughs of risk	Need to judge likely maximum risk	Top-down scoring too low	A
Job labelling	Deployment many been described as “military observers”, “peace keepers” or “humanitarian relief”	Words used may prejudice actual risk and imply an absence of threat	Top-down scoring too low	A, C, F

Comments on the top-down and bottom-up comparisons (2)

<i>Feature</i>	<i>Description</i>	<i>Issue</i>	<i>Implication</i>	<i>Example operations</i>
Armed/non-armed	Deployments may have been specifically non-armed	Assumption that this implies reduced risk	Top-down scoring too low	A, B
Few details	Little familiarity of the scorers to the type of operation	Wide variation in perception and scoring	Unreliable score	D, E
Short notice or duration operation	Not enough information available at the time	Pre-operational assessment may be difficult and needs to be revised later	Unreliable score	D, E

Comments on the top-down and bottom-up comparisons (3)

<i>Feature</i>	<i>Description</i>	<i>Issue</i>	<i>Implication</i>	<i>Example operations</i>
Routine operation	Operation seen to be similar to being in barracks or a training exercise	Operation may be seen as normal and not requiring any special treatment	Contentious score	E
Follow-on operation	The operation was post a “higher risk” activity	Tendency to maintain the higher level of risk despite a changed environment	Top-down scoring too high	H
Follow-on operation <i>alternative</i>	The operation was post a “higher risk” activity	Tendency to assess as <i>reduced</i> rather than <i>changed</i> risk	Top-down scoring too low	

Additional comments on bias for previous operations

Concerns

- Institutional and labelling biases, experiences, perceived merit and objective of the operation
- Previous warlike/non-warlike classification already existed
- Separating “what actually happened” from “what could happen”
- Bias towards “kinetic” casualties

Mitigations

- Self-policing mechanisms (consensus, trained SMEs, linkage to the Military Threat Assessment, rigorous process)

Conclusions

- **Original work now refined**
- **Arithmetic of the bottom-up (DORA) scores now checked against perceptions**
- **Body of experience now being used to build a database**
- **Expertise now becoming established**

Bottom line: now evolving towards a trusted tool to provide transparent, credible and auditable advice to senior decision makers



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Comments on the graph

1. Reasonable correlation even though the top-down scoring was arbitrary
2. Nearly all operations were in the same high level classification (warlike or hazardous). G is at the dividing line – not clear cut
3. Agreement very good at the top end (categories 4 and 5)
4. The spread of score is continuous – no clear breaks
5. Bottom-up score for the less hazardous operations are higher (eg A and B) than for the top-down appreciation
6. For a given DORA score there is a large spread of top-down values (eg C to G)
7. For a given top-down score, the spread of DORA scores is much lower (eg B to E)
8. A group of three (B, C and F) were well off the line