PROPOSED PROCEDURES FOR DEVIATING FROM OMP OUTPUT FOR THE RECOMMENDATION FOR A TAC, AND FOR INITIATING AN OMP REVIEW

D S Butterworth

MARAM (Marine Resources Assessment and Management Group)
Department of Mathematics and Applied Mathematics
University of Cape Town
Rondebosch 7701

Note: This document has been updated following comments received on earlier versions by members of the DWG (on two occasions) and the EAF WG. Modifications arising from comments provided by these members are shown highlighted in green. It was re-tabled at a recent meeting of the PWG as their final chance for further comments, but none have been received by the deadline stipulated. It is intended to be finalised by MCM, together with intended recommendation of a new OMP for hake at the end of October, so that the 26 October meeting will be the last chance for any further comments by members of the DWG. Note the sections highlighted in yellow give hake-specific proposals; different entries would be made in those sections for a new OMP for another species.

Preamble

Currently scientific recommendations for management controls (e.g. total allowable catch (TAC) or total allowable effort (TAE)) for South Africa's major fisheries are provided by Operational Management Procedures (OMPs). These are pre-agreed formulae for computing these control levels (usually annually), based on pre-agreed resource monitoring data inputs. This combination of formulae and data will have been simulation tested to ensure anticipated performance that is adequately robust given inevitable scientific uncertainties about data and models of the resource dynamics and fishery. (Typically these tests are divided into a core set (or "Reference Set") of "Operating Models" for the underlying dynamics, which cover the more plausible scenarios that have quantitatively important implications, and "Robustness tests" which involve operating models for scenarios considered relatively less plausible or important.)

The intention is that these OMPs be used on a routine basis to provide such scientific management advice, subject to regular four-yearly reviews. However, occasionally "Exceptional Circumstances" can arise which may indicate the need for recommendations to deviate from the outputs from such OMPs, or necessitate bringing the regular review forward. The purpose of this document is to specify the procedures governing the identification of such circumstances, and the resultant actions that may follow.

This document is constructed as a template that applies generally to OMPs, whatever the fishery to which they apply, but it does also include sections which are fishery-specific. Places where entries pertinent to a specific OMP are to be made are indicated by [ ].

These entries, and possible additions to them, require review and finalisation by the relevant MCM scientific Working Group in parallel with adoption of a new/revised OMP for a specific fishery.

Note that purely for simplicity of expression, the text that follows is written as if a global TAC were the only management recommendation output by an OMP. However, the provisions following should be understood to apply equally should global effort, either on its own or in conjunction with a global TAC be the output, and similarly if either or both of such measures are disaggregated by space or time or both.

When an OMP is adopted, the Working Group concerned will ratify a document that contains a complete specification of the formulae used by the OMP to compute recommended management control levels, and of the data to be input. The latter may, as appropriate, contain details concerning pre-processing of such data: for example the specification of a Generalised Linear Model (GLM) to standardise a resource abundance index for the effects of co-variates other than the year factor related to the abundance trend.

On a number of occasions below, the text requires judgements to be made of whether an effect is "appreciable" (for example, whether an abundance survey result is *appreciably* outside the range predicted in the simulation tests used in selecting the OMP). Such judgements are the province of the scientific Working Group concerned.

Simulation tests of OMPs assume, at basis, that future resource monitoring data required for input into the OMP will indeed become available as assumed, and that OMP recommendations will be implemented (and in an effective manner). Specific OMPs may include (simulation tested) rules for dealing with the absence of (some) such data, and to indicate adjustments perhaps necessary if implementation differs from the scientific recommendation arising from a previous application of the OMP. To the extent that circumstances arise that are not covered by such rules, and are adjudged by the Working Group to have a likely appreciable impact on the performance of the OMP that would otherwise have been anticipated, the Working Group may consider such an instance of "Exceptional Circumstances" as conceived in the text following.

1. Metarule Process

Metarules can be thought of as "rules" which prespecify what should happen in unlikely, exceptional circumstances when application of the TAC generated by the OMP is considered to be highly risky or highly inappropriate. Metarules are not a mechanism for making small adjustments, or 'tinkering' with the TAC from the OMP. It is difficult to provide firm definitions of, and to be sure of including all possible, exceptional circumstances. Instead, a process for determining whether exceptional circumstances exist is described below (see Fig. 1). The need for invoking a metarule should be evaluated by the MCM [Demersal] Working Group (hereafter indicated by WG), but only provided that appropriate supporting information is presented so that it can be reviewed at a WG meeting.

1.1 Description of Process to Determine Whether Exceptional Circumstances Exist

While the broad circumstances that may invoke the metarule process can be identified, it is not always possible to pre-specify the data that may trigger a metarule. If a WG Member or Observer, or MCM Management, is to propose an exceptional circumstances review, then such person(s) must outline in writing the reasons why they consider that exceptional circumstances exist, and must either indicate where the data or analyses are to be found supporting the review, or must supply those data or analyses in advance of the WG meeting at which their proposal is to be considered.

Every year the WG will:

- Review population and fishery indicators, and any other relevant data or information on the population, fishery and ecosystem, and conduct a simple routine updated assessment (likely no more than core reference set models used in the OMP testing refitted taking a further year's data into account).
- On the basis of this, determine whether there is evidence for exceptional circumstances.

Examples of what might constitute an exceptional circumstance in the case of [hake] include, but are not necessarily limited to:

- [Survey estimates of abundance that are appreciably outside the bounds predicted in the OMP testing.
- CPUE trends that are appreciably outside the bounds predicted in the OMP testing.
- Catch species composition in major components of the fishery or surveys that differ markedly from previous patterns (and so may reflect appreciable changes in selectivity).]

Every two years the WG will:

- Conduct an in depth stock assessment (more intensive than the annual process above, and in particular including the conduct of a range of sensitivity tests).
- On the basis of the assessment, indicators and any other relevant information, determine whether there is evidence for exceptional circumstances.

The primary focus for concluding that exceptional circumstances exist is if the population assessment/indicator review process provides results appreciably outside the range of simulated population and/other other indicator trajectories considered in OMP evaluations. This includes the core (Reference case or set of) operating models used for these evaluations, and likely also (though subject to discussion) the operating models for the robustness tests for which the OMP was considered to have shown adequate performance. Similarly, if the review process noted regulatory changes likely to effect appreciable modifications to outcomes predicted in terms of the assumptions used for projections in the OMP evaluations (e.g. as a result, perhaps, of size limit changes or closure of areas), or changes to the nature of the data collected for input to the OMP beyond those for which allowance may have been made in those evaluations, this would constitute grounds for concluding that exceptional circumstances exist in the context of continued application of the current OMP.

(Every year) IF the WG concludes that there is no or insufficient evidence for exceptional circumstances, the WG will:

- Report to the Chief Director Research, MCM that exceptional circumstances do not exist.

IF the WG has agreed that exceptional circumstances exist, the WG will:

- Determine the severity of the exceptional circumstances.
- Follow the "Process for Action" described below.

1.2 Specific issues that will be considered annually (regarding Underlying Assumptions of the Operating Models (OMs) for the OMP Testing Process)

The following critical aspects of assumptions underlying the OMs for [hake] need to be monitored after OMP implementation. Any appreciable deviation from these underlying assumptions may constitute an exceptional circumstance (i.e. potential metarule invocation) and will require a review, and possible revision, of the OMP:

- [Over recent years species splits of catches from the major fisheries considered in projections are not substantially different from those assumed for the OM projections, or (as appropriate) not outside the bounds for which associated feedback to changes has been incorporated within the OMP.
- Selectivities-by-age of the major fisheries do not differ substantially from assumptions made for OM projections.
- New CPUE and survey abundance estimates are within the bounds projected by the OMs.
- Recruitment levels are within bounds projected by the OMs.]

1.3 Description of Process for Action

If making a determination that there is evidence of exceptional circumstances, the WG will with due promptness:

- Consider the severity of the exceptional circumstances (for example, how severely "out of bounds" are the recent survey results or recruitment estimates).
- Follow the principles for action (see examples below).
- Formulate advice on the action required (this could include an immediate change in TAC, a review of the OMP, the relatively urgent collection of ancillary data, or conduct of analyses to be reviewed at a further WG meeting in the near future).
- Report to the Director Research, MCM that exceptional circumstances exist and provide advice on the action to take.

The Chief Director Research, MCM will:

- Consider the advice from the WG.
- Decide on the action to take, or recommendations to make to his/her principals.

Examples of 'Principles for Action'

If the risk is to the resource, or to dependent or related components of the ecosystem, principles may be:

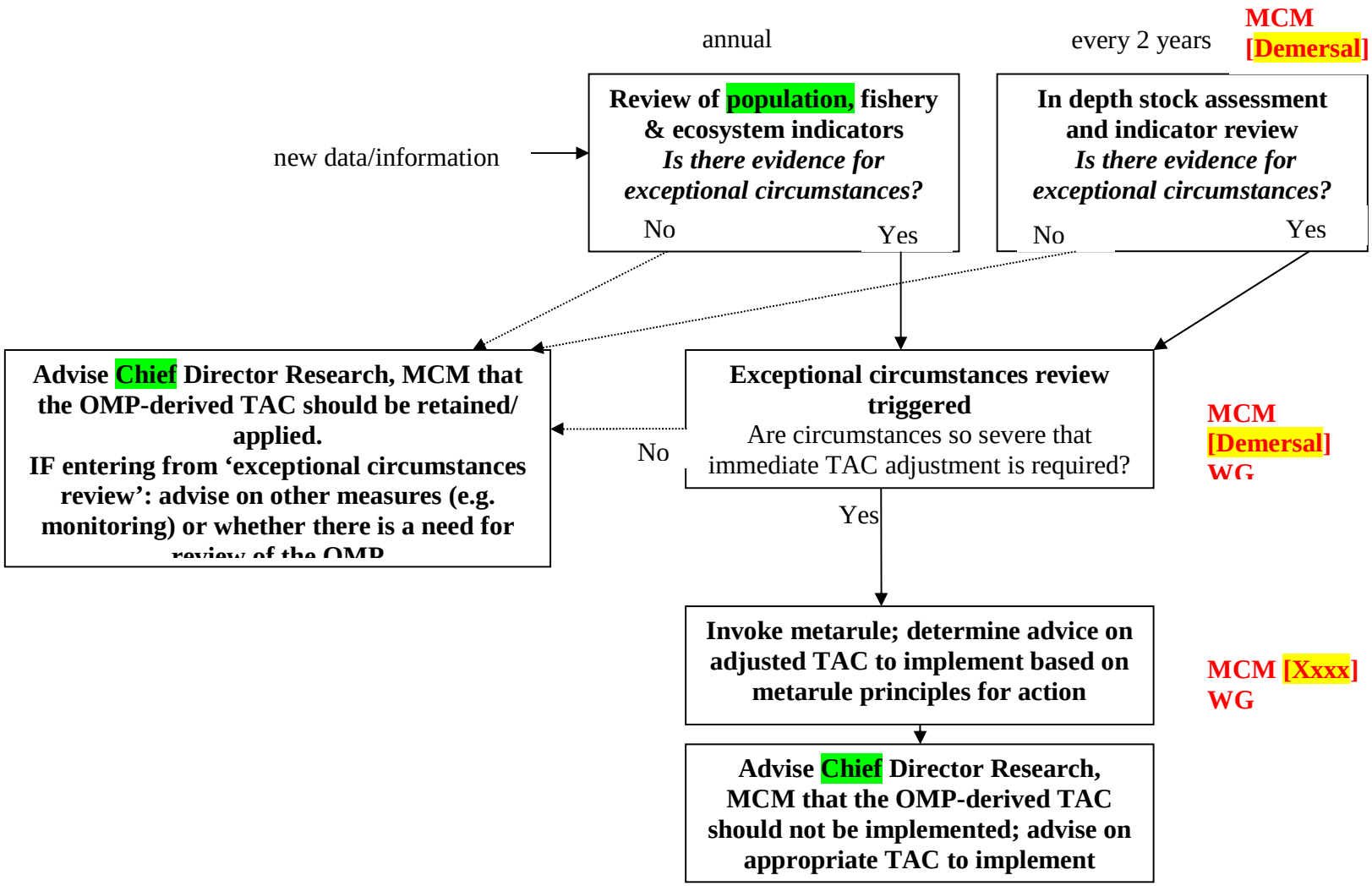
- The OMP-derived TAC should be an upper bound.
- Action should be at least an x% decrease in the TAC output by the OMP, depending on severity.

If the risk is of an unnecessary limitation on the fishery to socio-economic detriment, principles may be:

- The OMP-derived TAC should be a minimum.
- Action should be at least a y% increase in the TAC output by the OMP, depending on severity.

For certain categories of exceptional circumstances, specific metarules may be developed and pre-agreed for implementation should the associated circumstances arise (for example, as has been the case for OMP's for the sardine-anchovy fishery where specific modified TAC algorithms come into play if abundance estimates from surveys fall below pre-specified thresholds). Where such development is possible, it is preferable that it be pursued.

Figure 1: Flowchart for Metarules Process



2. Regular OMP Review and Revision Process

The procedure for regular review and potential revision of the OMP is the process for updating and incorporating new data, new information and knowledge into the management procedure, including the operating models (OMs) used for testing the procedure. This process should happen on a relatively long time-scale to avoid jeopardising the performance of the OMP, but can be initiated at any time if the WG consider that there is sufficient reason for this, and that the effect of the revision would be substantial. During the revision process the OMP should still be used to generate TAC recommendations unless a metarule is invoked.

2.1 Description of Process for Regular Review (see Fig. 2)

Every year the WG will:

- Consider whether the procedure for Metarule Process has triggered a review/revision of the OMP. Note that if proposals by a WG Member or Observer, or MCM Management, for an exceptional circumstances review include suggestions for an OMP review and possible revision, they must outline in writing the reasons why they consider this necessary, and must either indicate where the data or analyses are to be found supporting their proposed review, or must supply those data or analyses in advance of the WG meeting at which their proposal is to be considered. This includes the possibility of a suggested improvement in the manner in which the OMP calculates catch limitation recommendations; this would need to be motivated by reporting results for this amended OMP when subjected to the same set of trials as were used in the selection of the existing OMP, and arguing that improvements in anticipated performance were evident.

Every two years the WG will:

- Conduct an in depth stock assessment and review population, fishery and related ecosystem indicators, and any other relevant data or information on the population, fishery and ecosystem.
- On the basis of this, determine whether the assessment (or other) results are outside the ranges for which the OMP was tested (note that evaluation for exceptional circumstances would be carried out in parallel with this process; see procedures for the Metarule Process), and whether this is sufficient to trigger a review/revision of the OMP.
- Consider whether the procedure for the Metarule Process triggered a review / revision of the OMP.

Every four years since the last revision of the OMP the WG will:

- Review whether enough has been learnt to appreciably improve/change the operating models (OMs), or to improve the performance of the OMP, or to provide new advice on tuning level (chosen to aim to achieve management objectives).
- On the basis of this, determine whether the new information is sufficient to trigger a review/revision of the OMP.

In any year, IF the WG concludes that there is sufficient new information to trigger a review/revision of the OMP, the WG will:

- Outline the work plan and timeline (e.g. over a period of one year) envisaged for conducting a review.
- Report to the Chief Director Research, MCM that a review/revision of the OMP is required, giving details of the proposed work plan and timeline.
- Advise the Chief Director Research, MCM that the OMP can still be applied while the revision process is being completed (unless exceptional circumstances have been determined to apply and a metarule invoked).

In any year, IF the WG concludes that there is no need to commence a review/revision of the OMP, the WG will:

- Report to the Chief Director Research, MCM that a review/revision of the OMP is not yet required.

The Chief Director Research, MCM will:

- Review the report from the WG.
- Decide whether to initiate the review/revision process.

Figure 2. Flowchart for Regular Review and Revision Process