

**Report of the Second Intersessional Meeting of Panel 4
on North Atlantic Swordfish Management Strategy Evaluation (MSE)**
(Online, 30 June 2023)

1. Opening of the meeting and meeting arrangements

The meeting was opened by the Chair of Panel 4, Mr Amar Ouchelli (Algeria).

2. Appointment of the Rapporteur

Dr Lisa Crawford (United States) was appointed as rapporteur.

3. Adoption of agenda

In response to a request for clarification, an SCRS representative clarified that his presentations under agenda items 4 through 9 would provide a review of the work completed since the First Intersessional Meeting of Panel 4 on North Atlantic Swordfish Management Strategy Evaluation (MSE) in March 2023, with time for CPCs to ask questions and that discussion of the key decisions needed from Panel 4 would take place under agenda item 10. The agenda was adopted without changes and is included as **Appendix 1**.

The List of participants is attached as **Appendix 2**.

4. Review of Panel 4 feedback and requests in March 2023

Dr Kyle Gillespie (SCRS Swordfish Species Group Coordinator and North Atlantic Swordfish (N-SWO) Rapporteur) presented a summary of the work done by the SCRS on MSE for North Atlantic swordfish since the First Intersessional Meeting of Panel 4 on North Atlantic Swordfish Management Strategy Evaluation (MSE). Dr Gillespie reviewed the discussions, decisions, and requests made by the Panel at its March meeting, including with respect to the operating model (OM) grid and steepness values; assessing minimum size limits and increases in catchability via robustness tests; refinement of management objectives and Candidate Management Procedure (CMP) specifications; and the overall process regarding the N-SWO management strategy evaluation (MSE). Details on these decision points can be found in the [Report of the First Intersessional Meeting of Panel 4 on North Atlantic Swordfish Management Strategy Evaluation \(MSE\)](#).

5. Summary of work done since the March 2023 meeting of the Panel

Dr Gillespie presented a summary of the work done by the SCRS on MSE for North Atlantic swordfish since the Intersessional Meeting of Panel 4 in March 2023. The SCRS refined the OM structure, reconditioned the OMs, continued developing robustness and sensitivity tests, tested additional CMPs, and created plots to demonstrate tradeoffs in CMP performance. These revisions were approved by the Swordfish Species Group and communicated to stakeholders during the First Ambassadors Webinar on Northern Atlantic Swordfish MSE (N-SWO MSE) on 12 June 2023. The following sections provide further details on these updates.

6. Modifications to the OM grid

Since the First Intersessional Meeting of Panel 4 on North Atlantic Swordfish Management Strategy Evaluation (MSE) in March 2023, the SCRS revisited the steepness values as part of the OM grid. The values initially tested were 0.6, 0.75, and 0.9. New steepness values were generated and compared to similar species, leading to new values of 0.69, 0.8, and 0.88 with a midpoint of 0.8. A steepness value of 0.6 was retained as a robustness OM. These values were accepted by the Swordfish Species Group. The grid was reconditioned using historical biomass trends and productivity assumptions.

Dr Gillespie presented further modifications to the OM grid, namely the initial robustness OMs: recruitment variability, inclusion of catch at length data, and a 1% annual increase in catchability across a historical period. At the Panel's request, climate change was introduced as a potential robustness test, as it will have impacts on distribution, reproductive traits, and growth. However, Dr Gillespie explained that the connections between climate change and these life history characteristics have not been analyzed, and more time is needed to measure if climate change is having an effect on stock productivity. Implementation error (e.g., a way to account for overharvests, including from illegal, unreported, or unregulated (IUU) fishing), minimum size limits, and alternative management cycles were also included as robustness tests.

One CPC asked about the timeframe for conducting each robustness test, the feasibility of conducting multiple robustness tests, and what could be achieved by the end of the year. Dr Gillespie explained that, given the large number of robustness tests requested and the complex nature of certain tests, such as the alternative scenarios for climate change, the SCRS would likely not be able to accomplish the entire list before November 2023. The SCRS was interested in the Panel's input concerning which tests to prioritize this year and, to facilitate discussion, offered guidance on which tests could likely be accomplished in the near-term to inform the Panel's selection of a management procedure (MP) in November, and which tests would take more time.

7. Management objectives and key performance metrics

Dr Gillespie provided an overview of the management objectives categories (status, stability, yield, and safety) and summarized what the Panel discussed at the First Intersessional Meeting of Panel 4 on North Atlantic Swordfish Management Strategy Evaluation (MSE) in March 2023. The probability values considered for the status management objective category were 51%, 60%, and 70% PGK (probability of the stock to be in the green quadrant of the Kobe plot). For safety, the SCRS considered a 5%, 10%, and 15% probability of breaching LRP (Limit Reference Point, $0.4B_{MSY}$). Dr Gillespie provided an example of 10 simulations of minimum performance criteria over the first 10 years of 15% safety where B_{LIM} equaled $0.4SB_{MSY}$. Under one example only one simulation fell below the LRP, while in the second example, two simulations fell below the LRP. For stability, the probability values considered were +/-25% and no limit. A list of all the performance metrics for each management objective was presented.

Next, Dr Gillespie provided a summary of the tuning process and explained that tuning is important to allow for comparison among CMPs. In the conceptual model, many CMPs are created and then tuned to achieve PGK_{SHORT} (PGK over the short timeframe, i.e., 1-10 years). Each CMP is then tuned three times to 51%, 60%, and 70% PGK. Results are examined to verify if any CMPs failed to meet the safety criteria, and if so, they are redesigned or discarded. Those CMPs that meet safety and status criteria are kept and tradeoffs between these CMPs are assessed.

As an example, Dr Gillespie showed the performance of two CMPs over three probability levels of PGK over short, medium, and long time frames. He continued to describe the SCRS' methodology for filtering those CMPs that are considered "dominated" during testing by examining the tradeoffs between PGK and median TAC over short, medium, and long time frames. "Dominated" CMPs are those with worse performance with respect to both metrics. CMPs are only removed from further testing if they are considered "dominated" in all three time frames. Twenty-five CMPs remained after filtering dominated CMPs with respect to PGK and TAC. The SCRS also assessed whether CMPs were dominated by examining tradeoffs between TAC and the TAC variability (median variation in TAC vs. median TAC in 2024 and median TAC in short, medium and long time frames). CMPs are only removed if they are considered to be dominated in all four plots. After filtering out the dominated CMPs, only 13 remained for consideration. Dr. Gillespie provided a list of the 13 CMPs and denoted the empirical and model-based CMPs. He reiterated the importance of visualizing CMP performance using plots to discuss tradeoffs.

One CPC asked for confirmation on the approach to address variability in TAC between management cycles. Specifically, the CPC noted that, for model-based CMPs, the SCRS should be testing a TAC stability clause allowing a 25% increase and no limit on decreases when the stock was outside of the green quadrant of the Kobe plot as discussed at the First Intersessional Meeting of Panel 4 on North Atlantic Swordfish Management Strategy Evaluation (MSE) in March 2023. The CPC explained that it would be inappropriate to limit how much the TAC could decrease when the stock is not in the green quadrant and noted that this approach was taken for northern albacore tuna. Dr Gillespie clarified that the SCRS is currently testing CMPs

with a 25% stability cap applicable to both increases and decreases in TAC. The SCRS is also testing CMPs using no limitations on the amount the TAC can increase or decrease. He noted that if the Panel wants the SCRS to test model-based CMPs by applying a limit on TAC increases but no limit on TAC decreases when the stock is outside the green quadrant, such testing could be done and the results compared. The CPC strongly supported this work and noted the matter could be further considered under agenda item 10.

One CPC asked the SCRS to clarify if the model-based CMPs have only been tuned to 51% for PGK and if it was possible to tune to 60% and 70%. The SCRS clarified that the empirical CMPs tested thus far have been tuned to 51% for PGK_{SHORT}. If the Panel requested other tuning parameters, the efficiency frontier would shift, and any CMPs tuned to 51% would no longer be considered, and the list of top-performing CMPs would change. The SCRS Chair further clarified that the SCRS is in the process of identifying the highest performing CMPs across the tradeoff space considering multiple performance metrics. He reminded the Panel that the decision can be made to increase PGK at the expense of yield.

8. Initial CMPs and their results

Dr Gillespie provided an overview of the initial CMPs and their results. There were several plot types shown including: time-series plots of SSB/SSB_{MSY}¹ and TAC, Kobe time plots, and quilt plots. For the time-series plots, Dr Gillespie explained that each plot demonstrates how each CMP responds to a range of conditions and biomass changes. The Kobe time plots show the percentages of simulations in the Kobe matrix over a given time period to provide a sense of the probability of being in any area of the Kobe matrix in any given year for simulation modeling. Quilt plots help in the consideration of management tradeoffs. Each row represents a CMP, and each column represents a different performance metric. The color of the boxes in the plot refer to the relative scale of the values within each column: lowest values are light, and highest values are dark. Dr Gillespie reminded the Panel that the SCRS will continue to perform calculations and report on testing. He advised that the Panel needs to consider the volume of information produced and consider what information is important when making decisions about CMPs. He also explained that the results of the CMP testing will be in the results section online in an interactive application, rather than in primary summary tables.

Dr Gillespie also summarized the outputs of the MSE process including various plot types, which may be important for decision-making. These plots can be reviewed by the Panel in an online application called the Slick tool. An external expert provided an overview of the Slick tool, which is designed to be an interactive application to look at the results of an MSE in a way that allows the user to control how information is presented. The expert demonstrated how to load data files, see CMPs, view radar plots with performance metrics, filter results, and toggle through various performance metrics. Results and plots will be continuously updated as more results become available.

One CPC asked why, given the healthy status of the stock, CMPs indicate the need to reduce the TAC in the early part of the projection period. Dr Gillespie explained that for some scenarios the projection outputs show that SSB increases and the TAC stays the same. He clarified that if the Panel expressed desire to see results of 60% or 70% PGK in the short-term, then some drop in TAC would be required and looking at multiple time periods may be helpful for decision-making. The external expert added that, in the early stages, the SCRS is looking to find the best model performance by identifying the most responsive CMPs, understanding why certain CMPs are non-responsive and attempting to modify them, and optimizing model performance to meet fishery objectives.

¹ SSB is spawning stock biomass, i.e., biomass of mature females. SSB/SSB_{MSY} is a measure of whether a stock is overfished.

9. MSE development timeline for 2023

Dr Gillespie provided an overview of the MSE development timeline. Over the next few months, the technical team will develop additional CMPs, communicate model tradeoffs, and continue work on CMPs. He explained that the more CMPs that are presented will allow the technical team and the Panel to discuss tradeoffs and make better decisions. Dr Gillespie presented an MSE development timeline beyond 2023 that detailed the activities, data inputs, and associated years. Based on Panel feedback, the SCRS considered the timing of MSE review, MP runs, and advice implementation. For the default management cycle, advice will be given for three years, and in the final year of TAC implementation, the MP will be run again with updated data and stock assessment data to ensure that the simulation framework is appropriate and the MSE is working properly. Exceptional circumstances will be evaluated annually. MSE review was added to the timeline for 2032.

One CPC asked how the review specified in 2032 is different from the MP review conducted during stock assessments and why the MSE is only reviewed and reconditioned after the MP has been applied four times, which is nine years into the process. Dr Gillespie clarified that there are two forms of review denoted in the table: the first form is stock assessments, which allows new information about stocks to be used in the place of values that were estimated by the MSE to verify that conditioning from the past is appropriate; the second form is MSE review, which takes a broad look at simulation procedures and informs whether simulations need to be reconditioned. If the stock assessment steps indicate that other factors need to be considered, then a review before year nine will be required. The Panel can request that these reviews be undertaken. The SCRS Chair discussed the process related to interactions between the SCRS and the Panel when factoring new information into the process. He explained that it is possible to recondition earlier than scheduled if any issues are detected before year 9. Exceptional circumstances could be identified, for instance, or early reconditioning could be triggered based on the outcome of a stock assessment.

10. Key decisions to be taken by PA4 for:

a. *Choice of a key performance metrics, timeframes, and minimum/maximum acceptable thresholds (if applicable) for each of the Status, Safety, Stability, and Yield objectives*

Dr Gillespie reintroduced the questions and key decisions to be made by the Panel, and he summarized key factors to consider when choosing performance metrics. Factors to consider include: species biology, time period, current Kobe status, base case models for MSE, key tradeoffs for metrics, relationships between status, yield, safety, and stability, and levels of variability.

i. *Status: stock being in the green quadrant of the Kobe matrix*

One CPC stressed that 51% was not an acceptable value for status and expressed a strong preference for values of 60% to 70%. Another CPC agreed and suggested eliminating 51% as a minimum acceptable threshold value and expressed preference for probability values of 60% and 70%. Dr Gillespie warned that the current results reflect untuned CMPs, and the point of choosing tuning parameters is to make sure the models are responsive to biomass trends and patterns. Considering comments made by others, a CPC asked that the Panel consider narrowing the status values to 55%, 60%, and 65%. Another CPC expressed interest in tuning to the three previously identified levels with a goal of exploring tradeoffs and narrowing down the status percentage. A third CPC proposed testing CMPs at status values between 60% and 70% PGK.

An observer supported narrowing the status values to between 60% and 70%, and explained that 51% is not appropriate as it is essentially equal odds for being in or out of the green quadrant. They noted that a status level of 60% PGK has been adopted for the two previous ICCAT MPs. Further, the observer suggested that the TAC levels that were displayed in the quilt plot would be likely to increase after tuning, which would represent an increase from recent catch levels.

With respect to primary performance metrics for status, the Panel agreed to PGK_{SHORT}, PGK_{MEDIUM}, PGK_{ALL}, and PNOF (probability of not overfishing). Due to differing views of the CPCs on whether to further limit or narrow the range of PGK values to be tested for the status management objective, the Panel decided to continue testing 51%, 60%, and 70%.

ii. Safety: stock breaching the limit reference point (LRP)

Dr Gillespie explained that there are four possible performance metrics for the safety management objective that represent four time frames, and there are three probability values associated with each performance metric. Any performance metric that does not meet the 15% threshold probability level of falling below the LRP (i.e., B_{LIM} , which is defined as $0.4 \cdot B_{MSY}$) is discarded. He asked the Panel for feedback regarding the time frames. The SCRS Chair added that for the safety metric of B_{LIM} in bluefin tuna CMP testing, performance had to be tuned so that it could be viewed as a reduction in fishing intensity to increase the model performance relative to safety. As a consequence, PGK could rise and it may be the case that a percentage would not have to be selected for safety. He explained that the objective of the testing is for CMPs to achieve minimally acceptable management objectives, which may require exceeding the minimum values for some of the objectives, i.e., exceeding PGK while meeting the safety objective or vice versa. Dr Gillespie affirmed the point of the SCRS Chair, explaining that safety is not a tuning target, but a filter. The SCRS has tested multiple acceptable values including 5%, 10%, and 15%, all of which are maintained with the initial set of CMPs because they are able to exceed 15% of B_{LIM} safety threshold. In other words, the CMPs have a 15% or lesser chance of breaching the LRP and most are below 5%.

The SCRS Chair provided an overview of how safety was viewed in previous MSE determinations. He reiterated that the safety management objective refers to the probability associated with breaching the LRP. Previously, safety had been examined across the entirety of projections, with the exception of the early 10-year period for bluefin tuna. In that MSE, evaluation of safety did not begin until year 11. He explained that the SCRS does not have the same concerns for N-SWO because the stock status at the beginning of the projection period is much higher than for bluefin tuna. He noted that evaluating safety for the early years of the projection period may be appropriate, and that it may be prudent to test LRP_{SHORT} and LRP_{ALL} to determine if there is more than a 15% probability of the stock falling below B_{LIM} in the short term and over the entire 30-year projection period. If the Panel preferred that the LRP is never breached, that would reduce the number of permutations to be run.

Following the comments from the SCRS Chair, one CPC expressed a preference for testing LRP_{ALL} across the 30-year time frame as the primary performance metric. The Panel agreed, noting that the SCRS would also test the three other LRP timeframes (short, medium, and long) and present those outputs to the Panel.

Regarding the safety percentage, an observer suggested narrowing the value to be tested to reduce the SCRS workload. The observer stressed that 15% was too high given the healthy status of the stock, expressed a preference for 5%, and suggested a compromise of 10%, which would give clear direction to the SCRS. Some CPCs were not ready to narrow down the safety percentages, wishing to see the outcome of testing first. The value of this approach in the bluefin tuna context was noted.

The Panel agreed that the SCRS should continue to test 5%, 10%, and 15% as the threshold values for safety, with 15% acting as a filter to remove CMPs that do not satisfy this management objective.

iii. Stability: change in TAC between management cycles (if desired)

Dr Gillespie presented the choice between two performance metrics: VarC and MaxVarC, which refers respectively to the median and maximum variation in TAC between management cycles over all years. As a primary performance metric, the Panel chose VarC. With respect to the threshold values for the stability management objective, the SCRS reminded the Panel that it was testing a 25% cap on TAC changes (up or down) between management cycles and no cap. A CPC reiterated its request from the March Panel 4 meeting that the SCRS test the model-based CMPs with a stability clause of $\pm 25\%$ when the stock is in the green quadrant of the Kobe plot and a 25% cap on TAC increases and no limit on decreases when the stock is outside the green quadrant. Another CPC noted its preference for testing a cap on both TAC decreases and increases regardless of whether or not the stock was in the green quadrant as this would provide stability to the fleet.

The SCRS Chair clarified that, under the current approach, the SCRS is evaluating no limits on TAC change (up or down) between management cycles and, separately, it is looking at limiting TAC changes between management cycles to +/-25%. The SCRS could, for model-based CMPs only, add testing of a limit of +/-25% when the stock is in the green quadrant of the Kobe plot and a limit of 25% for TAC increases and no limit on decreases when the stock is outside the green quadrant. This approach, however, would not work for empirical CMPs as it would not be known if the stock is in the green quadrant since empirical CMPs are not based on stock assessments.

The Panel agreed to continue testing a stability clause of +/- 25%, as well as no limits for all CMPs, and, for model-based CMPs only, to add testing of both +/-25% when the stock is in the green quadrant of the Kobe plot and 25% for TAC increases and no limit on decreases when the stock is outside the green quadrant. With respect to primary performance metrics, the Panel agreed to use VarC while acknowledging that information on MaxVarC would still be provided.

iv. Yield: catch levels

Dr Gillespie explained that the four performance metrics in the yield category represent three time spans: years 1-10 (short), years 11-20 (medium), and years 21-30 (long); as well as one time point for assessing the TAC in year one (TAC1). Following the intervention of a CPC, the Panel asked that the SCRS consider all four time span options for yield (TAC1, TAC_{SHORT}, TAC_{MEDIUM}, TAC_{LONG}).

b. Tuning objective, including time frame

The Panel was presented with a choice of tuning objectives, including the time frame. The SCRS recommended tuning to PGK_{SHORT} at three probability values (51%, 60%, and 70%) and using safety as a filter. The SCRS also noted that the MSE technical team could explore alternative timeframes to see how CMP performance is affected. After prolonged discussion about the effect of different timeframes on TAC, numerous CPCs expressed support for the SCRS recommendation and the Panel agreed to this way forward.

c. Definition of minimum threshold for TAC change between management cycles, if desired

Dr Gillespie introduced the next decision related to the possible establishment of a minimum threshold for TAC change between management cycles. The Panel was asked if there was interest in setting such a threshold and, if so, whether the value should be expressed in tonnes or as a percentage of the TAC. Depending on the Panel's feedback, the SCRS could conduct testing to inform the Panel of the potential consequences of various minimum threshold values to potentially include in the MP. Dr Gillespie noted that the value tested would be an upper threshold and the Panel could adopt any value equal to or less than that value in the MP should it decide that establishment of a minimum TAC change threshold was desirable.

A CPC noted that establishing a minimum TAC change threshold would relieve CPCs of the obligation to implement relatively small changes in the TAC resulting from the application of the MP, reducing the administrative burden on the Panel and its CPCs. It was noted that Panel 2 adopted minimum TAC change thresholds of 50 t in the West and 1,000 t in the East for bluefin tuna. Those thresholds were evaluated to ensure that there would be no negative effects on the stocks if implemented. A CPC expressed a preference for setting a threshold in tonnes rather than establishing a percentage and suggested that 100-200 t be used for testing. Another CPC noted uncertainty about the need for the threshold as domestic changes in quota are typical, and there is little administrative burden associated with changes in TAC. That CPC expressed a preference for no threshold but suggested that if one was to be considered, it should be small and symmetrical. Another CPC agreed that a minimum TAC threshold should be tested through MSE and suggested a value of 200 t. There was general support for this approach, with the understanding that the Panel was not making a decision to adopt a 200 t threshold at this meeting. Rather, the Panel would reconsider the issue after seeing the results of the testing by the SCRS.

The SCRS Chair noted that the technical team would proceed with testing a value of 200 t. If the Panel considered at a later stage that the value was too high, it could consider a lower value or chose not to set a minimum TAC change threshold. The value would also be evaluated symmetrically, that is, the same tonnage in the case of an increase or decrease in TAC.

d. Prioritize robustness OMs for analysis in 2023

Dr Gillespie presented a table containing the work plan and priorities for CMP testing over the coming months. Additional tests were included in the table for the Panel's consideration including: increases in catchability, climate change (by looking at recruitment as a proxy for climate change until a more robust approach could be developed), and size limit (including removing all size regulations). Further testing could allow the SCRS to differentiate between CMPs that are otherwise able to achieve management results, which could explain the behavior of a CMP when exposed to situations outside the OM grid. The SCRS reiterated the timing constraints associated with adding additional tests and asked for the Panel's guidance on the direction for the technical team regarding possible robustness tests.

One CPC expressed interest in examining the size limit to better understand how the current regulations are working. They also expressed interest in understanding climate change effects on recruitment. Another CPC intervened to support testing the effects of climate change on recruitment and also expressed a preference to see the output from the robustness test looking at implementation error, given the comments in the [Report for Biennial Period, 2022-23 Part 1 \(2022\), Vol. 2](#) on IUU fishing, underestimates of discards, and other aspects of underreporting. A third CPC expressed a preference for testing climate change effects on recruitment, size limit, and catchability in historical and projection periods. The external expert reiterated the timing limitations associated with the additional tests requested, noting that testing size limits and recruitment patterns do not require model reconditioning, and expressed gratitude to the Panel for providing a clear ranking of priorities for robustness tests. He explained that the immediate priority for the technical team is to refine CMPs for OMs.

One CPC asked if the climate change tests would involve time series data or if data collection would be required. Dr Gillespie explained that climate change is complex and will have numerous effects on the life history of the stock including distribution, reproduction, size classes, and movement patterns. Climate change analyses will likely also need to consider how fishing fleets respond to climate change, such as moving fishing grounds. The SCRS cannot yet say which data sources will be used to assess and predict climate change impacts. The Panel was reminded that, given the scope, it will take years to fully understand the effects of climate change on the stock; however, in the near-term, assumptions can be made with regard to climate change impacts on the productivity of the stock through recruitment deviation tests.

After a productive discussion, the Panel agreed that the prioritized list, in no particular order, of robustness tests would be as follows: climate change (recruitment), catchability (historical and projection), implementation error, size limits, and minimum threshold for TAC change.

11. Other matters

One CPC noted that one of the assumptions in the MSE process is that the TAC is set equal to catch. They mentioned that, over a number of years, the catch has been less than the TAC by a significant amount and asked the SCRS how this discrepancy could be accounted for in the MSE process. The SCRS Chair explained that setting the TAC equal to catch would not be an issue in the process because empirical- and model-based procedures look at how the population is responding to actual catch taken. In practice, the actual catch would be used regardless of whether it is equal to the TAC. Dr Gillespie added that, from a technical perspective, this would be a simple phenomenon to test in simulations by including negative patterns in the implementation error. The CPC noted that they have no issue with the MSE or OMs, but rather they are concerned with how the Panel would implement the MP given the mismatch in recent years between the catch and the TAC and the potential impact on allocations. The CPC suggested that the SCRS might explore whether the mismatch could be addressed within the CMPs. The SCRS Chair clarified that, with the MSE, the selectivity patterns are not from current allocations but from selectivity patterns observed in the data. If the TAC was set higher than catch, this would be the same as the best estimate from a stock assessment. The SCRS Chair noted that TAC advice comes from the MSE analysis to achieve management objectives across yield, safety, status, and stability. He indicated that, if the TAC can be supported by the stock, but it exceeds the catch, this could raise management questions, such as with regard to allocations. He stressed that it would not be appropriate to bring such matters to the SCRS, as policy decisions related to management measures are for the Panel to decide upon.

12. Adoption of the report and closure

The Panel agreed to adopt its report by correspondence.

After thanking the Secretariat, SCRS, interpreters, rapporteur, and participants for their hard work and contributions to the meeting, the Chair adjourned the meeting.

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10. Key decisions to be taken by PA4 for:
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 - b. Choice of tuning objective, including time frame
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11. Other matters
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