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“View on Assurance (Ensurance !!)”



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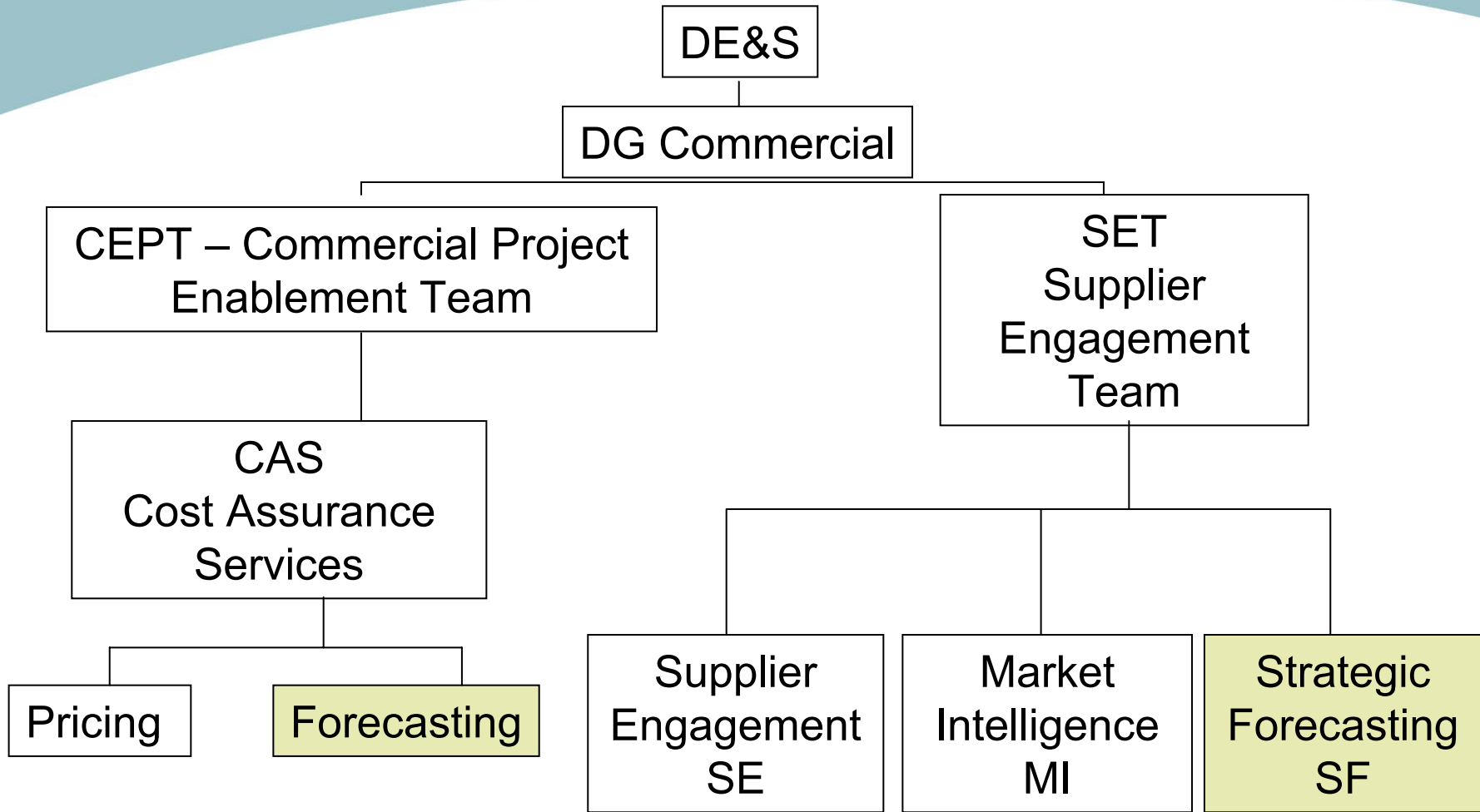
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Drivers for a “New approach to Cost Assurance”

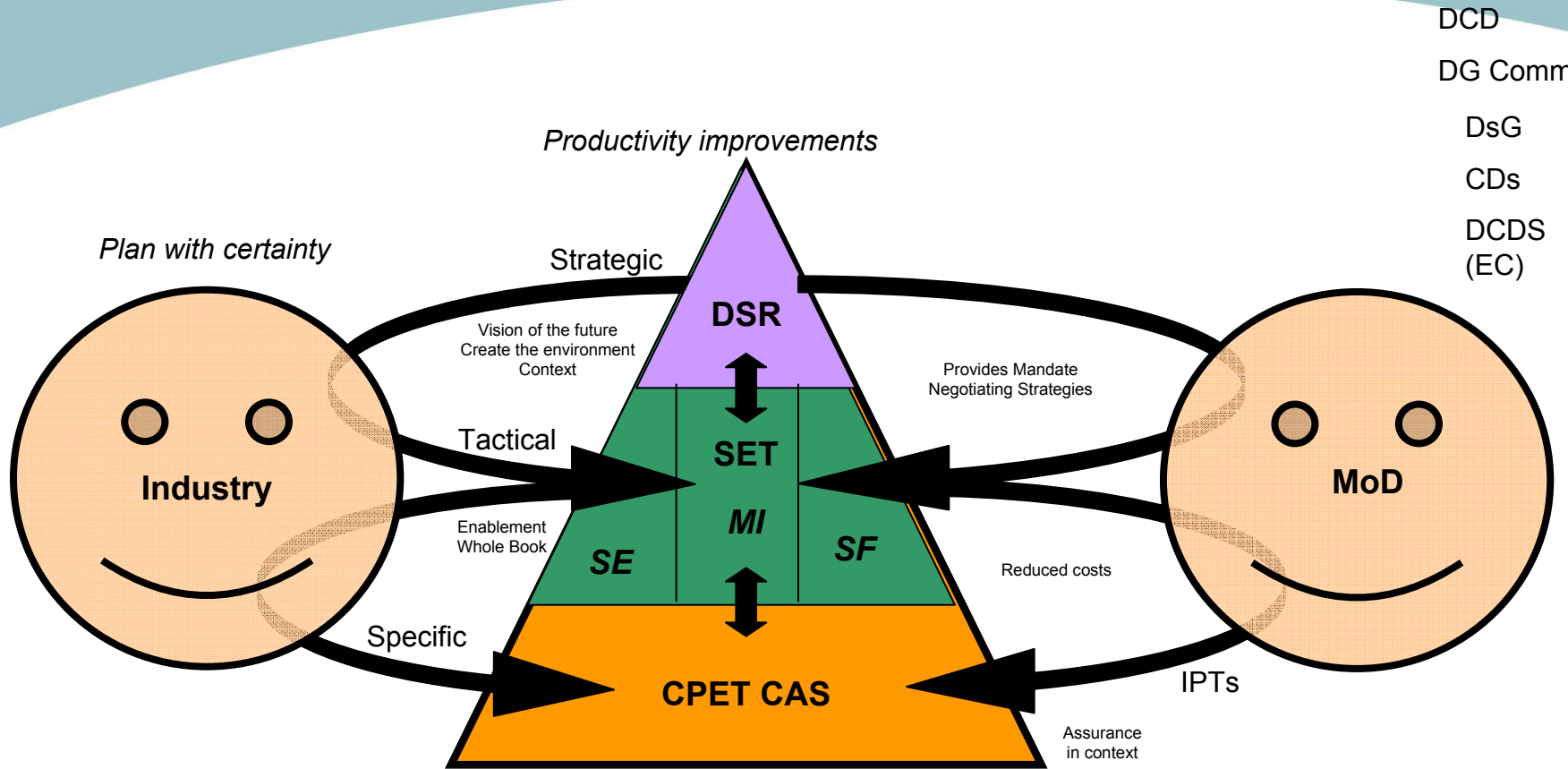
- **Formation of DE&S**
 - DE&S, SCRUTINY AND APPROVALS (S&A) GUIDANCE, Issue 1- Dated Mar 07
 - Revised Financial Assurance of IAB & DE&S Business Cases 2nd April 2007
- **TLF – Through Life Finance**
 - Early engagement
 - Consistency of Cost Models – (Validation & Verification)
 - Cost Assurance
- **DACP – Defence Acquisition Change Programme - DG S&A**
 - “Better Cost Estimating”
 - Centre of Excellence
 - Policy and Process
 - » Cost Models
 - » Cost assurance – Cat A & B
 - » Data & MDAL
 - Skills (user and expert)
 - Behaviours – The “Isms” (Optimism, entryism & Shortism)



New DE&S - Forecasting Teams



SET/CEPT – New roles and teams



Smarter Acquisition & TLCM



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Revised Financial Assurance of IAB & DE&S Business Cases 2nd April 2007

DE&S Scrutiny and Approvals (S&A) Guidance

FINANCIAL ASSURANCE & FUNCTIONAL LEADS/SME

	Initial & Main Gate	Review Note
IAB Cat A IAB Cat B Cases going to Ministers	<p>DG Finance provides Assurance Assured by FC supported by DG Fin ASS Desk Officer</p> <p>Functional & SME advice:</p> <ul style="list-style-type: none"> • DASA DESA (IA) • SET SFT (Estimates) • D Mat Progs (Affordability) • D Mat Efficiency (Benefits) • D FM Accounting Treatments (Partnering Arrangements & Accounting Treatments if required) 	<p>DG Finance provides Assurance Assured by FC supported by DG Fin ASS Desk Officer</p> <p>Functional & SME advice:</p> <ul style="list-style-type: none"> • DASA DESA (revision or new IA as appropriate) • SET SFT (Estimates if significant changes) • D Mat Progs (Affordability) • D Mat Efficiency (Benefits if appropriate)



Assurance - Roles & Responsibilities of DE&S IPT's

IPTs need to:

- **Engage** with the **DE&S Financial Assurance team**
- **Engage** with the **in-house cost estimating and forecasting specialists** at the commencement of a project, or new project phase, to agree the TLF analysis process, the provision of costing services, sources of data, the outputs and estimating assurance programme.
- As per DPAFinDir/13/2/3(035/07) – D/DLO/DGLR (37.07) dated 26/02/07 relating to new arrangements for **sourcing cost models** in the DPA and DLO, IPTs should not engage external consultancy support until the forecasting requirement has been assessed and in-house resource availability is determined.
 - To confirm with suppliers of cost analysis that any computer model used to forecast costs has been subject to **validation and verification**.
- Ensure that the estimates have an audit trail and take **responsibility for the financial data** in products such as the **MDAL, IA and Business Case**.



Requirement for Cost Model - V&V

- **Cost models** are often used to calculate through life costs, assess risk impacts, carry out sensitivity analysis and enable trade off activity. In order to increase confidence in the modelling capabilities used for costing and to reduce the risk of misleading analysis being provided to the decision makers, an aim has been set that all such cost modelling capabilities be subject to Validation & Verification.
- The model must be appropriate for the type of system and programme phase for which the estimate is being produced.



VERIFICATION

- **Verification** is the process of checking that a model is consistent with its specification and is free from material errors (e.g. mathematical or logic).



VALIDATION

- **Validation** aims to determine the extent to which a model represents the real world situation, thus providing information from which judgements can be made on whether the model can be used as a credible analytical tool for a specific purpose. Control of the following key areas dictates the effectiveness of a model in use and its consequent fitness for purpose:
 - a) ***Modelling reality***: The model's processes and / or algorithms.
 - b) ***Data***: (whether used to feed or calibrate a model.) These have different sources which may include other models.
 - c) ***Model and Data Management***: This covers the development of a model, its use and maintenance, and impinges on the previous two areas.
 - d) ***Operator skills***: The availability of people with skills and experience to support the model and assessment of their experience and specialised competence.



ESTIMATING/COST ASSURANCE

- When Cost and Schedule predictions are submitted for Approval it is necessary that they have been reviewed and Assured according to guidelines in order that an assessment can be made as to the validity of the costing contained within the model and the results output from the model.
- Estimating Assurance is concerned with the prediction “goodness” of cost and time and relies on the provision of supporting evidence.
- Estimating Assurance on behalf of the DE&S Finance Director can only be carried out by SET/CEPT Assurance who can sub-contract elements of the process but have responsibility for the final overall assessment of the Project.



Assurance

Variations in cost and schedule estimating and forecasting situations are too great to permit an exhaustive listing of all the factors to consider. However, the following criteria should be considered in all cases:

- Completeness
- Reasonableness
- Consistency
- Documentation
- Credibility



Completeness - *Completeness is a measure of a model's ability to capture all significant costs that will be incurred by a defence system over its useful life.*

- All relevant costs included?
- Costs time-phased by financial year?
- Industrial capacity considered?
- Basis of costs defined (current year Economic Conditions (ECs or future costs)?
- Cost risks and uncertainties included and correctly applied?
- Cost outputs correctly reported and confidence limits explained?
- Sensitivity analysis performed/results analysed?
- Key cost drivers identified?



Reasonableness

- Factors used reasonable?
- Ground rules and assumptions reasonable?
- Relevant and normalised historical cost data base used?
- Appropriate costing methodology used?
- Cost predictions are reasonable when compared to reference equipments or historic trends?
- Technology maturity assumptions consistent with manufacturing capability?



Consistency

- Correct inflation indices used?
- Assumptions consistent with planned or current deployment schedule?
- Differences between prior and current predictions explained?
- Assumptions consistent with current programme?
- Dependencies with other programmes identified?
- Assumptions consistent between alternatives and reference system?



Documentation

- Data sources and assumptions documented in a Master Data and Assumptions List (MDAL) and/or Cost Data Assumptions List (CDAL) agreed by all stakeholders?
- Risks consistent with master risk register?
- Cost model documentation provided?
- Cost elements fully documented?



Credibility

- Cost model verified and validated (V&V'd)?
- Data types identified (contracted costs, published or catalogue or actual)?
- The range of predicted outcomes is consistent with the quality of the input data?
- Are the providing staff appropriately trained in tool use?



Documentary Review

- The first Assurance task to be completed is the documentary review. As a minimum the following Documents should be requested from the IPT:
 - Project Plan – this document gives valuable background information to the Assessor, highlighting the stakeholders and putting the planned procurement into context.
 - Risk Register – The Risk Register is a key document. It highlights all the risks identified by the Project Team, any mitigation and should be directly comparable with the minimum/most likely/maximum figures used to populate the Risk model.
 - Minutes of Risk Meetings – Provides key evidence of stakeholder involvement and an ongoing risk maturity process.
 - Risk Estimating Maturity Level Assessment – Evidence of an independent assessment of a Project's Risk Estimating Maturity Level. This should be of recent origin (certainly within the last 12months) and at Level 3 or higher.



Cost Model Review

- The Cost Model itself should be investigated to ensure that it is fit for purpose and working correctly. This can take the form of:
 - IPT provides evidence that the model has been reviewed by a 3rd party or,
 - In the case of PFG-produced models, that the PFG Output Assurance procedures have been properly applied.
 - Otherwise the model can be investigated and tested by the Assessor or PFG staff to provide Assurance..



Cost Model Review (cont)

- Each Model should be accompanied by the following elements which must be properly reflected in the model:
 - Master Data and Assumptions List (MDAL) and Audit Trail - This is the main supporting document for the Cost Model and explains where each of the inputs to the model has come from and what calculations and adjustments have been made to the inputs in the model.
 - Cost Resource Breakdown Structure (CRBS) – This will provide details of where the costs fall.
 - Validation and Verification (V&V) Certificate – provides evidence that the cost model used has been Verified, (to establish that the model / process meets its specification) and Validated (to establish that the model / process is fit for purpose) by an independent expert.
 - Link to Risk Register - The Assessor must check that all items identified and costed in the Risk Register are accurately reflected in the model and correctly modelled using approved risk-modelling software.



Cost Tracking

- In order to give full assurance for a Project's estimated costs it is necessary to track the costs used from source data to the final output in the Business Case. In order to do this the Assessor needs access to the following information:
 - Source Documentation – All source documentation detailing costs should be viewed and traced to the Cost Model.
 - Evidence of Cost checks – Evidence is required that the Costs are complete and reasonable. This can be in the form of Peer Review but should include an assessment of cost realism.
 - High Level Review of Cost Model – Given the source data and MDAL it may be possible for the Assessor to develop a much-simplified model to ensure the Project Cost model outputs are broadly in line.
 - Cost Model Outputs – The Cost Model outputs should be traceable to those input to the Business Case



Assessment

Assessment can be one-off or, more-likely, iterative whereby the stages above are revisited when Issues or problems arise. Following completion of the stages above, the Assessor is required to:

- Review the Evidence – Is there enough evidence available to support an overall marking of the Project?
- Sensitivity Analysis – Has sensitivity analysis been carried out? Are output cost predictions highly volatile to a small change in inputs?
- Optimism Bias Assessment (OBA) – Has an OBA been carried out? Is this broadly in line with the bottom-up approach to risk carried out by the IPT?
- Issues - Are there any outstanding issues which could be regarded as “show-stoppers”? Is there time to revisit these issues?



Assessment (Cont)

- Recommendation – What is the overall marking for the Project?
This should take the form of GREEN, AMBER or RED.
 - GREEN marking would indicate a full Estimating Assurance assessment – the Estimates reflect an adequate expectation of the costs of the Project with clearly defined and costed risks.
 - AMBER marking tends to indicate that the Assessor is reasonably happy with the Estimates but that the evidence for full assurance is missing.
 - RED marking indicates that there is a significant shortfall in the quality of the Estimates due to a lack of evidence or problems encountered during the assessment process.



Potential Assurance Issues

- **Insufficient Documentation** - The estimate is impossible to substantiate with any certainty and cannot be replicated by a third party. The documentation does not sufficiently describe the data sources, methodologies, calculations, or assumptions used.
- **Omitted or Incomplete Cost Elements** - Costs that are applicable to a programme have been omitted from the estimate. A Cost / Resource Breakdown Structure (CRBS) tailored to the project has not been generated and agreed in conjunction with the MDAL.
- **Data and Assumptions not defined** – The Master Data and Assumptions List (MDAL) has not been agreed by stakeholders or is not consistent with other programme documentation. Further, the MDAL has not been formally agreed and checked such that the estimating assumptions match the programme documentation.
- **Inconsistency with Previous Predictions** - No explanation is given for differences in cost that result from changes in policy, manning, operating concepts, procurement quantities, etc.
- **Presentation of Results** - No standard format is used to present results at the various milestones. The level of detail is insufficient. No reference system or historic trend is identified for purposes of comparing the proposed alternatives.



QUESTIONS



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Through-Life Assurance

